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Examining Switching Intention Drivers: Perspectives from the Push-Pull-Mooring Model

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ABSTRACT

Consumers choices and needs changes according to the changing trends and technologies, the purpose of this study is to investigate the switching decisions or intentions of the consumers towards EV's. The concept of Push, Pull and Mooring paradigm is used to examine the switching intention decision. Push factors relates to the dissatisfaction of the current vehicle whereas pull factors shows the advantages or attractive features of the EVs and mooring factors denotes the behavioural or psychological resistance that facilitates or hinders the switching options. For these 110 responses are collected from non-adopters of electric vehicles or in other words the respondents are currently using conventional vehicles of out of which 105 valid samples are used for this study. Findings of this study shows that push factors have a strong positive impact on the switching decisions and mooring factors has moderate positive impact on the switching intention whereas the pull factors show weak and negative impact on the switching decisions. It shows that respondents switch to EV's because of the dissatisfaction of their current vehicles.
Keywords: Switching Intentions, Electric Vehicles, Push, Pull and Mooring Paradigm.

1. Introduction:

Almost 25% of all energy-related CO2 emissions globally come from the transport sector, making it one of the biggest contributors to greenhouse gas emissions (IEA, 2023). Governments, businesses, and consumers are looking for sustainable mobility options as a result of the growing reliance on fossil fuels and the worsening state of the environment. Among these, electric vehicles have become well-known as an eco-friendly invention that can lower emissions, improve energy efficiency, and help achieve global climate change mitigation objectives. EV market adoption is still restricted in many areas, especially among current users of conventional internal combustion engine vehicles, despite technology breakthroughs and regulatory incentives surrounding EVs. This discrepancy between awareness and adoption draws attention to a critical behavioural issue: comprehending conventional car owners' intents to migrate to electric vehicles.

Switching intention refers to an individual's planned behavioural shift from one product, service, or technology to another, often driven by a combination of dissatisfaction with the current option and attraction toward the alternative (Bansal et al., 2005). In the context of EV adoption, switching intention reflects the readiness or willingness of conventional vehicle owners to replace their current vehicles with electric ones. Unlike general adoption intention, which may represent openness to new technology, switching intention encompasses the psychological, social, and economic considerations involved in discontinuing an existing habit and embracing a new technological paradigm. Thus, it represents a more complex decision-making process influenced by multiple behavioural, technological, and contextual factors.

This integration is especially important in developing nations like India, where the need for transport is growing quickly and there are serious environmental issues. The shift from conventional to electric vehicles is still rather slow, despite the government's efforts through a number of programs, schemes, and financial incentives. Therefore, developing successful treatments to hasten the adoption of EVs requires an understanding of the behavioural reasons underpinning this transformation.

2. Review of Literature:

Athapol Ruangkanjanases et al., (2024) in the study "Unveiling Multi-Dimensional Factors of Consumer Switching Intention Towards Electric Vehicles" explores consumers' intentions to switch from traditional fuel vehicles to electric vehicles by employing the Push-Pull-Mooring (PPM) model as an analytical framework. It seeks to gain a deep understanding of how push factors (such as financial, infrastructure, privacy, and environmental risks), pull factors (such as product innovativeness, instrumental attributes, and policy support), and mooring factors (such as inertia and switching costs) influence consumers' switching decisions of Taiwan consumers. This study suggests that consumers are more concerned with tangible benefits and risk considerations when adopting electric vehicles rather than being constrained by existing habits.

Wai Kin Lim et al., (2024) in their study "Electric Vehicle Choices in Malaysia: A Conceptual Model Investigating Switching Intentions through the Push-Pull-Mooring Model" examines individuals' intention to transition from motorized vehicles to EVs by using a Push-Pull-Mooring (PPM) model that incorporates institutional theory. By integrating the push factors such as perceived environmental threat, regulative environment, and pull factors recognized as alternative attractiveness, normative environment, as well as mooring factors, which is willingness to pay into a single framework. The results of the study aim to provide insights for EV stakeholders, policymakers, scholars, and future studies by identifying determinant factors influencing the intention to switch to EVs in Malaysia.

Xianfeng Hu et al., (2024) in their study "Determinants of consumers' intentions to switch to electric vehicles: a perspective of the push–pull–mooring framework" aims at understanding how push, pull, mooring factors affects the factors influence consumers' intention to shift from conventional vehicles to electric vehicles. Based on 886 validated questionnaires from six pilot cities, findings reveal that push factors such as price consciousness and social influence are effective in convincing consumers to switch from conventional vehicles to electric ones. In line with our expectations, mooring factors such as perceived risk and inertia have a negative effect on consumers' switching intentions. Furthermore, perceived risk and inertia significantly reduce the positive effect of push and pull factors on consumers' switching intentions. These findings provide important implications for China's transition to low-carbon transportation.

Shahla Asadi et al., (2021) in their study "Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia" aimed at identifying the influencing factors on consumers' intention to use electric vehicles. To this end, a model has been developed based on two theoretical models called the Norm Activation Model and the Theory of Planned Behaviour. The potential consumers in Malaysia were selected to answer questionnaires. Accordingly, 177 valid questionnaires were collected and the influencing factors on the electric vehicles purchase intention were empirically analysed using a structural equation model. According to the results, perceived value, attitude, the ascription of responsibility, subjective norms, personal norms, perceived consumer effectiveness, and awareness of consequences affected the consumers' electric vehicles' purchase intention significantly and positively. Consumers' behaviour regarding the adoption of electric vehicles can be understood better through the findings of this study, while electric vehicle development can be promoted as well

3. Objectives of the Study:

1. To identify the demographic factors associated with EV non-adopters.
2. To develop a model exploring the switching intentions of non-adopters towards electric vehicles.

4. Research Methodology:

This study makes use of both primary data and secondary data. Purposive sampling method is used to select the sample respondents, who are currently using conventional vehicles and are intended to replace their vehicles in the near future. The respondents were reached by the survey prepared using Google forms. In order to make this study more practical a sample size of 110

respondents was selected. After eliminating incomplete questionnaire, a valid number of 105 respondents were used for further analysis.

Conceptual Framework:

The Push-Pull-Mooring (PPM) framework was first introduced in the study *Moon, B. (1995). Paradigms in migration research: Exploring the push–pull–mooring framework.,* which explains people's motivations to switch, is depicted in the diagram. In this study, in addition to push and pull factors, mooring factors are also introduced as a new dimension for the better understanding of the human migration behaviour. The term "switching intentions" in this context refers to a person's intention to switch from their present conventional vehicles to electric vehicles.

The model suggests that three groups of factors influence switching intentions:

Push Factors:

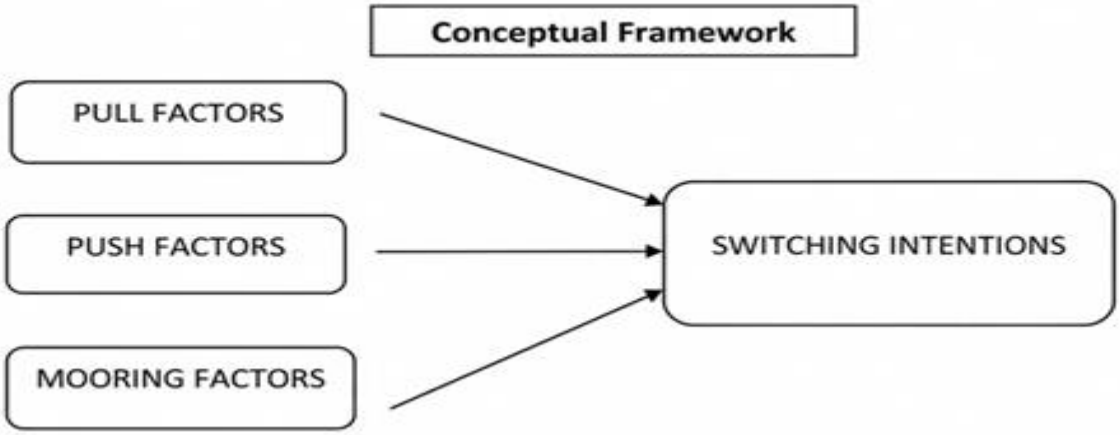
Push factors implies the dissatisfaction associated with the current vehicle used. These elements "push" individuals away from their conventional vehicles. Push factors may include high maintenance cost, inconveniences faced by them, environmental concerns such as air pollution, poor performance.

Pull Factors:

Pull factors includes the appealing features of the alternative. These factors "pull" people towards the adoption of EV which includes the higher performance, cost savings, environmental advantages and better features.

Mooring Elements:

The decision to switch can be strengthened or weakened by several variables, which might be contextual, societal, or personal. These elements serve as "anchors" that could facilitate or obstruct the change. These consist of personal values, financial restraints, social standards, habits, and perceived hazards.



5. Findings & Discussion:

SPSS version 23 software was used for data analysis. For the purpose of analysis descriptive statistics were obtained for frequency distribution. Descriptive statistics and PLS SEM is used to analyse the given data.

Table 5.1 Profile of the Respondents

Profile of the Respondents		No. of Respondents	Percentage
Age	18 – 25	12	11
	26 – 45	64	61
	46 – 60	21	20
	Above 60	8	8
	Total	**105**	**100**
Educational Qualification	School Level	17	16
	Under Graduation	47	44

	Post-Graduation	35	33
	Others	6	6
	Total	**105**	**100**
Employment Status	Students	6	6
	Salaried	57	55
	Business	36	34
	Others	5	5
	Total	**105**	**100**
Monthly Family Income	Less than 25000	25	24
	25,001 – 50,000	43	41
	50,001 – 75000	20	19
	Above 75000	16	15
	Total	**105**	**100**

From the above table it can be seen that majority (61%) of the respondents belong to the age group of 26 – 45, have educational qualification up to under graduation and are engaged in business. Most (41%) have a monthly family income of 25001 - 50000.

Table 5.2. Vehicle Ownership Profile

Profile of the Respondents		**No. of Respondents**	**Percentage**
Type of Vehicle Owned	Two-Wheeler	50	47
	Four-Wheeler	55	53
	Total	**105**	**100**
Fuel Variant	Petrol	64	61
	Diesel	36	34
	CNG	5	5
	Total	**105**	**100**
Years of Usage	Less than 3 Years	20	19
	3 – 5 Years	29	27
	5 – 10 Years	43	41
	More than 10 Years	13	12
	Total	**105**	**100**

From the above table it can be seen that majority (53%) of the respondents are having four – wheeler are having petrol variant vehicles and majority of the respondents are using their current vehicle for 5 – 10 years.

Impact of PPM factors on Switching Intentions

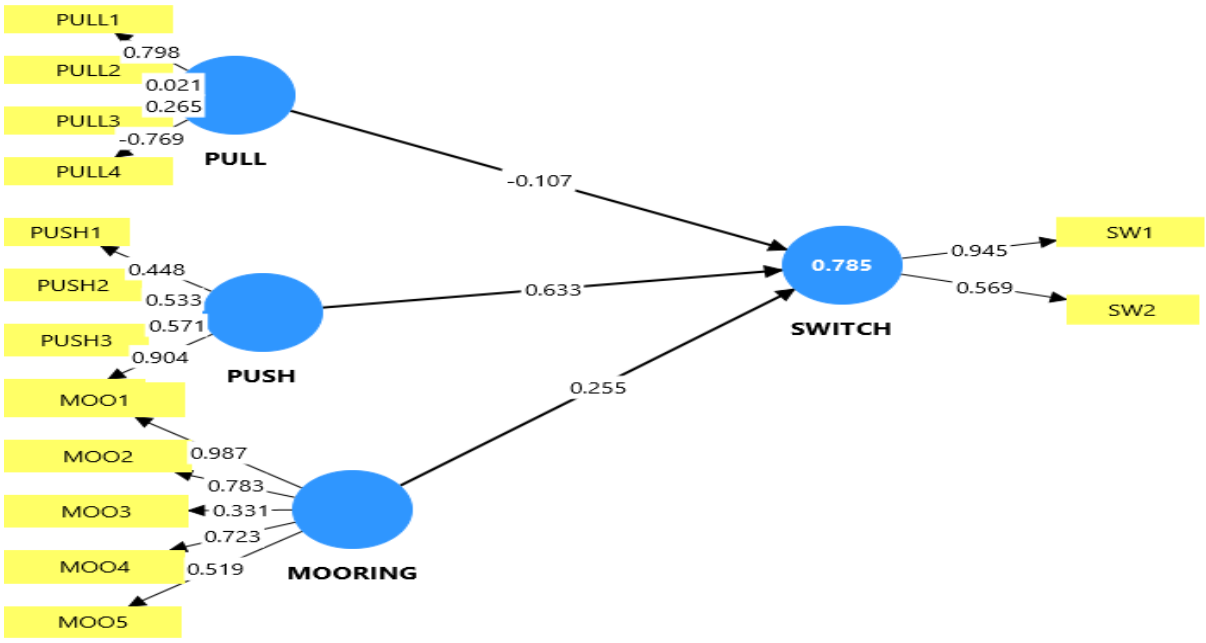
Within the Push–Pull–Mooring (PPM) paradigm, the structural model shows how Push, Pull, and Mooring influences affect Switching Intention. The model's explanatory power and variable linkages are demonstrated by the latent variable scores, path coefficients, and indicator loadings are considered. The following hypotheses are formulated to depict the Switching decisions of the respondents towards EVs.

H_{01}: Pull factors have a strong influence on Switching Intentions.

H_{02}: Push factors have a strong influence on Switching Intentions.

H_{03}: Mooring factors have a strong influence on Switching Intentions.

SEM MODEL SHOWING PPM FACTORS ON SWITCHING INTENTIONS



Measurement Model Interpretation

Variables	Measurement Items	Reference
Pull Factors	EVs would reduce my daily running costs.	Adapted from Moon, B. (1995), Bansal, H. S., Taylor, S. F., & James, Y. S. (2005), Feng, H., & Sun, Y. (2020), Hou, A., Zhang, W., & Wang, Y. (2021), Kang, J., & Kim, S. (2019)
	EVs are technologically superior more modern than my current vehicle.	
	Using an EV would improve my social image	
	Charging at home or work would be convenient for me.	
Push Factors	Rising fuel costs make my current vehicle less attractive.	Adapted from Moon, B. (1995), Bansal, H. S., Taylor, S. F., & James, Y. S. (2005), Priessner, A., Sposato, R., & Hampl, N. (2021).
	My current vehicle causes me concern due to pollution	
	Frequent maintenance/repair costs for my current vehicle are a problem.	
Mooring Factors	I am emotionally attached to my current vehicle.	Adapted from Moon, B. (1995), Bansal, H. S., Taylor, S. F., & James, Y. S. (2005), Habich-Sobiegalla, S. (2022), Egbue, O., & Long, S. (2012), Peters, A., & Dütschke, E. (2014)
	Switching to an EV would involve high financial switching costs for me.	
	My family/friends would support me if I switched to an EV.	
	I prefer to delay big purchases until I'm sure about technology	
	Availability of servicing and spare parts for EVs in my area affects my decision.	
Switching Intentions	I intend to purchase EV in the near future	Adapted from Bansal, H. S., Taylor, S. F., & James, Y. S. (2005).
	My next purchase would be a EV	

All constructs Push, Pull, Mooring, and Switching Intentions are represented by multiple indicators. The indicator loadings range from moderate to high, confirming acceptable convergent validity. Loadings for Push Factor Indicators (PUSH1–PUSH3) range from 0.448 to 0.904, indicating variation but generally respectable dependability. The Pull Factor Indicators (PULL1–PULL4) range from 0.021 to 0.798, suggesting that some indicators—like PULL2 = 0.021may not accurately reflect the construct and should be refined. Strong loadings between 0.519 and 0.987 are shown by

the Mooring Factor Indicators (MOO1–MOO5), indicating strong measurement validity. Strong loadings (0.945 and 0.569) for the Switching Intention Indicators (SW1–SW2) demonstrate that these items accurately reflect switching behaviour. The range of indication loadings is With an R^2 value of 0.785 for the Switch construct, the PPM variables together account for 78.5% of the variance in switching intention, demonstrating a significant explanatory capacity.

Pull → Switch (β = –0.107)

Thus, H_{01}: Pull factors have a strong influence on Switching Intentions is rejected showing that Pull variables and switching intention have a weak and negative relationship. This implies that switching in this situation is not influenced by attractive features of the Electric vehicles. Therefore, pull factors have negative influences on the switching intention behaviour.

Push → Switch (β = 0.633)

Secondly, H02: Push factors have a strong influence on Switching Intentions is accepted. Switching intention is pjositively impacted by push factors. This suggests that dissatisfaction or bitter experiences of the existing vehicle is an important factor that have a strong impact in the switching decision of the respondents. This is the most significant predictor of all the paths.

Mooring → Switch (β = 0.255)

Finally, H_{03}: Mooring factors have a strong influence on Switching Intentions is accepted and shows a moderate impact in the switching decisions of the respondents. Switching intention is somewhat positively impacted by mooring factors. In certain situations, habits, switching costs, and social ties—can promote switching even if they typically prevent it. According to this model, mooring variables seem to facilitate rather than impede the intention to switch.

Push effects dominate the switching decision, indicating that users are primarily motivated by dissatisfaction or negative experiences with their current vehicles. Mooring factors moderately support switching, suggesting lower behavioural or psychological resistance. Pull factors do not significantly influence switching, implying that the benefits or attractiveness of the EVs are not compelling enough in this sample. This model demonstrates a strong capacity to predict switching intentions ($R^2 = 0.785$). These findings provide empirical evidence for the differential roles of push, pull, and mooring forces in shaping the switching decisions.

6.Conclusion:

This study used the Push-Pull-Mooring (PPM) framework to investigate the factors that influence switching intention and offered empirical insights into how these factors influence people's behavioural transitions. The results show that push factors such as dissatisfaction, perceived inconvenience, or bad experiences related to the present vehicle have the greatest impact on switching intention. People are more inclined to think about EVs when they feel limited or unsatisfied, which supports PPM's theoretical underpinnings that highlight the motivational power of unfavourable circumstances. Additionally, mooring factors demonstrated a strong and favourable effect, indicating that contextual facilitators, social influences, or individual dispositions lessen inertia and promote switching. This research challenges the conventional belief that anchoring aspects primarily impede behavioural change by showing that they function more as accelerators than barriers in the current environment. By illustrating the situational flexibility of mooring influences, this makes a significant theoretical contribution. On the other hand, switching intention was not significantly predicted by pull factors. EV’s attractiveness or advantages were inadequate to encourage switching, suggesting that significant push motivations may be necessary in addition to positive appeal. Overall, a significant amount of the diversity in switching intention was explained by the model, confirming the PPM framework's applicability. By highlighting the necessity of addressing unhappiness and lowering switching resistance, the study advances both theory and practice. By using longitudinal models, improved measurement scales, and comparative studies across other user segments, future research can broaden these discoveries.

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