

Exploring the Influence of Governmental Policies on Hybrid Car Purchase Intention in Malaysia

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Abstract: Malaysia continues-face environmental problems caused by rapid development and urbanization. The environmental issues have induced automotive industries to produce more environmental friendly cars that will reduce the damage to the environment. The objective of this study is to explore the influence of governmental policies including free parking fee, car price subsidization, auto scrappage program, road tax exemption, import tax exemption, sales tax exemption and excise tax exemption on consumer hybrid car purchase intention in Malaysia. In addition, this study also examines the relationship between governmental policies and hybrid car purchase intention. The finding of the study enables to provide valuable information to the policy maker and vehicle manufacturer on improving the penetration rate of hybrid car in Malaysia's market. The questionnaires will be distributed to 400 respondents who live in Malaysia. SPSS and AMOS will be used to analyze the data collected.

Key words: Automotive industries, governmental policies, hybrid car, purchase intention, Malaysia

INTRODUCTION

As industrialization continues to evolve, the worsening of environmental issues such as global warming and climate change have raised concerns among the world's population (Beliveau, 2010). The significant changes in climate have caused natural disasters including severe storms, shrinking of polar ice caps, flooding, droughts, depletion of the ozone layer and a rise in the sea level (Madhav, 2010). The automotive industry can be regarded as one of the major industries contributing to environmental pollution and the increasing number of vehicles and congestions in the world has become the root cause of air pollution. Carbon dioxide (CO₂) emissions from the transportation sector account for a significant percentage of global CO₂ emissions (Zhang and Cooke, 2009). Vehicle's engine combustions processes generate many different toxic gases such as hydrocarbon, carbon monoxide and nitrogen oxides. Today consumers are aware of the dangers of ecological problems such as air pollution, global warming, climate change and waste disposal. People have also begun to expect that vehicles of the future are not merely fuel efficient but also

eco-friendly. In recent years, vehicle producers are competing to produce more environmentally friendly vehicles.

Literature review: A hybrid car can be explained as a type of vehicle that combines at least 2 different energy sources in order to mobilize the car. A hybrid car can reduce energy usage through electric storage systems to save part of the energy produced by the gasoline engine and regenerative braking. The hybrid technology vehicles have overcome the limitations of traditional electric cars by combining an electric battery with the power and performance of a conventional engine (Frank, 2007; Foley, 2003; Brevitt, 2002). The hybrid car's dual engine characteristic enables it to achieve the fuel-efficiency function and improves the performance of the car (Foley, 2003). Hybrid cars can be further classified into 2 groups, i.e., "parallel" and "series" hybrid. In a "parallel" hybrid vehicle, gasoline provides momentum energy to the combustion engine and the batteries supply power to an electric motor. The batteries are recharged during driving. Both of them can power the vehicle either separately or simultaneously. A "series" hybrid links the gasoline combustion engine and electric motor. The

combustion engine drives an electric generator instead of directly driving the vehicle wheels. When the battery power is at a low level, the engine provides power to the battery automatically to run the vehicle (Curtin *et al.*, 2009).

Purchase intention: Green purchase intention is the desire of a consumer in preference and their intention to buy, environmentally friendly products (Aman *et al.*, 2012). Green purchase intention can be explained as a particular type of environmentally friendly behaviour which is exhibited by consumers to express their concern towards the ecological system. Ramayah *et al.* (2010) indicated that green purchase intention is a crucial factor for determining the behaviour of consumers. As consumer's intention to purchase a green product increases, there is a higher probability that a purchase decision will be made.

The consumer will not pay any extra amount of money for green product nor will they compromise over the quality of green products. Eco-friendly characteristics associated with the product cannot stimulate a purchase. Identifying the key factors influencing consumers purchasing intention toward hybrid car is necessary if the vehicle manufacturer want to gain the competitive advantage in the market. The following paragraphs will introduce the influence of governmental policies on hybrid car purchase intention.

Governmental policies: Government policy can be defined as an intentional course of action followed by a government institution or official for resolving an issue of public concern (Clarke *et al.*, 2009). They further explained that government policy is basically a course of government actions or inactions taken in response to social problems. The transportation sector can be regarded as one of the major sources of air pollution in Malaysia, accounting for 70-75% of emissions (Afroz *et al.*, 2003). The environmental issues have raised government's concern to impose tax incentives to stimulate the sales of hybrid vehicles in Malaysia. Many promotional efforts have been conducted by the government to improve the adoption of hybrid vehicles domestically in order to reduce dependency on fossil fuels. During 2011, the Malaysian Government announced that import duty and excise duty would be fully exempted for hybrid vehicles with an engine capacity <2.0 L. The sales of hybrid cars soared to 8,334 units in 2011 as compared to 327 units in 2010 (M.I.A., 2009).

The governments in many countries have imposed tax incentives to improve consumer's adoption of hybrid vehicles, for example, in Malaysia, the US, France and Japan. The sales of hybrid vehicles improve significantly

due to government intervention. These phenomena are consistent with the results of many aforementioned research studies such as Diamond (2009), Gallagher and Muehlegger (2011), Sallee (2008), Chandra *et al.* (2010). In this study, several governmental policies will be identified to explore the level of influence on hybrid car purchase intention. The governmental policies including free parking fee, car price subsidization, auto-scrappage program, road tax deduction, import tax deduction, income tax deduction, excise tax deduction, insurance cost rebate and maintenance cost rebate.

Free parking fee: The vehicle plays an important role in travel and each vehicle's journey, regardless of its motivation, location or duration, requires there to be a space at its final destination to park the car. The vehicle owner need to pay the fee in exchange for parking facility provided. The expense and availability of a parking facility is an important determinant of whether or not residents chose to own a transport and also whether they choose to drive to a specific destination (Tom, 2014). He further explained that local authorities possess direct control over the use of parking space in their areas and therefore of the supply and price of on street parking. Many local authorities own public off-street car park hence, they possess direct control of pricing on parking service.

Numerous studies have been conducted to examine the influence of parking fee incentive on household's choice for green vehicle included hybrid, conventional gasoline and alternative fuelled vehicle. The study conducted by Adler *et al.* (2003) indicated that incentives such as free parking and tax free purchases would encourage Californian residents to adopt a green vehicle. The finding of Potoglou and Kanaroglou (2007) obtained the different results with them. Potoglou and Kanaroglou (2007) concluded that incentives such as permission to drive on high occupancy vehicle land with one people in the car and free parking do not influence preference of household toward green vehicle. The inconclusive results from previous studies have induced researcher to conduct a study to explore the influence of free parking fee policies on resident's hybrid adoption in Malaysia. The empirical results of the study can be roles as guideline on government's policies development on improving the rate of penetration of hybrid car in domestic market.

MATERIALS AND METHODS

Hypothesis development: The hypotheses are developed to confirm the conjectured relationship between governmental policies and hybrid vehicle purchase intention. Figure 1 shows the research framework of this study.

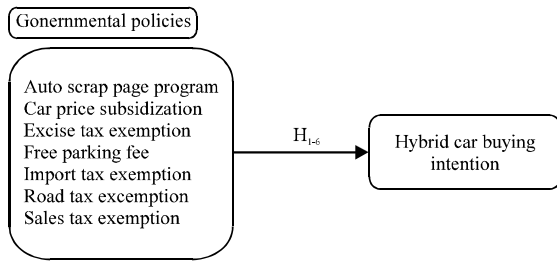


Fig. 1: Proposed theoretical framework

Hypothesis: There is a significant relationship between governmental policies and purchase intention:

- H₁: There is a significant relationship between auto scrappage program and hybrid purchase intention
- H₂: There is a significant relationship between car price subsidization and hybrid car purchase intention
- H₃: There is a significant relationship between excise tax exemption and hybrid car purchase intention
- H₄: There is a significant relationship between free parking fee and hybrid car purchase intention
- H₅: There is a significant relationship between road tax exemption and hybrid car purchase intention
- H₆: There is a significant relationship between sales tax exemption and hybrid car purchase intention

The aim of this study is to explore the influence of governmental policies on consumer hybrid car purchase intention in Malaysia and investigate the relationship between governmental policies and purchasers intentions. The population of this research will be Malaysia's residents. According to the national census results conducted by Malaysia Statistic Department in 2010, the population of Malaysia is approximately 1.6 mln. Data collection method can be regarded as an integral part of research design (Uma, 2003). Approximately 400 questionnaires will be distributed to residents in Malaysia via postage mail or personnel delivery. After completion of data collection, the researcher will conduct data analysis on the raw data in order to obtain valuable results. In the quantitative data analysis, Statistical Process for Social Science (SPSS) and Analysis of Moment Structure (AMOS) will be used to analyze the raw data. Data from questionnaire will be analyzed in terms of reliability analysis, factor analysis, mean, frequency, standard deviation, descriptive analysis, Chi-square-test, regression and structural equation modeling.

RESULTS AND DISCUSSION

Car price subsidization: The price of hybrid vehicles in Malaysia is high if there is no government tax exemption.

The higher price of hybrid vehicles has reduced the acceptance level of consumers. The adoption of hybrid car is dependable on a number of dynamics included price competitively to within the reach of the average people (Browne *et al.*, 2012; Montalvo, 2008). Previous empirical studies have concluded that financial benefits possess significantly influence on consumer's green vehicle adoption (Mourato *et al.*, 2004). The study further emphasized that financial benefit can improve consumers willingness to adopt green car which could reduce the operation cost and enhance fuel efficiency. Yew and Hussain finding revealed that government intervention such as purchase price subsidization will increase electric vehicle purchase intention in Malaysia. Beresteanu and Li (2011) expressed that subsidize purchase price is one of the effective ways to stimulate the sales of hybrid car. Bacon clearly stated that subsidy for green vehicle is a government intervention policy with the purpose of improving the market penetration of green vehicle by decreasing the selling price or production cost.

Subsidy policies are found widely in many countries where the government promotes the adoption of green vehicle. For example, the federal government in the United States adopted several policies with an estimated total budgetary cost of 7.5 bln. to encourage the purchase and production of electric vehicle, those policies including subsidize for buyer to purchase electric vehicle, financial support for the manufacturer that produces electric vehicle, developing education program to enhance consumer knowledge about electric vehicles and improving the infrastructure of recharging stations (Gecan, 2012). In the year 2009, the Japan government imposed the "Green Vehicle Purchasing Promotion Measure" to improve the green car adoption. Japan government provides purchase of environmentally friendly car with up to one hundred thousand Yen subsidy on purchase price and combination of exemption incentives and tax deduction (JAMA., 2010).

The government's subsidy on hybrid car purchase price enables the selling price of hybrid cars to become more affordable for the consumers to buy. Although subsidy policy have been used by many countries to stimulate the sales of green vehicle but the feasibility of similar policies still remain unclear if imposed in Malaysia. The empirical results of this study enable us to examine the effectiveness of the subsidy policies in improving consumer's adoption toward hybrid car in domestic market.

Auto scrappage program: Auto scrappage program provides eligible car buyers a cash rebate when trading in an old car for purchasing or leasing a new car. Numerous countries such as France, Germany and the United

Kingdom have similar programs which generally possess a same objective to improve the environment and to provide stimulus to the national economy by improving vehicle sales (Li *et al.*, 2013). In 2009, Germany's government announced an auto-scrapping incentive for private new car buyers to boost vehicle demand in the domestic market. The auto-scrapping incentive subsidises €2,500 to each new vehicle buyer for used car replacement. The launch of the auto-scrapping incentive influenced the sales of vehicles significantly. According to data provided by Global (2010) new registrations for private vehicles increased from 29-36% over the year. The United Kingdom Government subsidised £2,000 to the buyers of new vehicles under the auto-scrapping incentive. Under this scrapping scheme, new vehicle buyers were allowed to trade in their vehicle if it was aged >10 year, in exchange for £2,000. Under the stimulus of the auto-scrapping incentive, approximately 314,000 orders were received for new vehicle registrations (Global, 2010). The French Government imposed a car-scrapping program to stimulate domestic vehicle demand during the recession. The car-scrapping program offered 1,000 Fr to the owners of old cars for the purchase of a low-emission vehicle (16 g CO km⁻²). The sales of new vehicles significantly increased by approximately 2.5% during the first three quarters of 2009 (Smith, 2009).

According the second stimulus package tax commentary report published by M.I.A. (2009) indicated that Malaysia also imposed auto scrappage program to stimulate the domestic auto sales during national economic recession time. Under the auto-scrappage program, RM5,000 will be paid to car buyers, who trade in their cars which are at least 10 year old for the purchase of new Perodua and Proton vehicle. This program has been widely adopted in a number of countries during the global recession which started in 2008. This happened because financial storm heavily and influence global automobile industry (Huang *et al.*, 2014). However, there is limited study to evaluate effectiveness of auto-scrappage program in influencing consumer adoption toward hybrid car in Malaysia, this kind of phenomena has induced researcher to conduct a study to explore the results on it.

Road tax exemption: Road tax is an annual tax levied which impose on vehicle in order to use public roads. Typically, the amount of tax levied is based on transport characteristics including engine power size and vehicle weight (Harmsen *et al.*, 2003). They further explained that vehicle road tax is increasingly linked to particular environmental characteristics such as carbon dioxide and other pollutant emissions. Road tax incentive has been

imposed by numerous countries' government to improve consumer adoption toward electric vehicle. Germany and Sweden imposes road tax exemption for a period of 5 year upon 1st year registration for electric vehicle purchase. Similar road tax exemption policy is also imposed by Greece and United Kingdom to improve market penetration of environmentally friendly car in order to decarbonize the vehicle sector and to reduce fossil oil dependency (Gass *et al.*, 2014). The road tax exemption policies have shown to be the most effective in accelerating low carbon technology vehicle adoption and reducing greenhouse emissions.

A forementioned Road tax exemption policy is imposed by several countries including United Kingdom, Greece, Germany and Sweden to increase the consumer acceptance toward the environmentally friendly car. To the best of the author's knowledge Malaysia government does not adopt road tax exemption policy to stimulate the sales of hybrid car in domestic market. Although, many studies have been conducted to evaluate the influence of road tax exemption policies on green car buying decision but there is not even one study that has been conducted to prove the feasibility of this policy in Malaysia. It is necessary to conduct a study to examine the effectiveness of road tax exemption policies to improve penetration rate of hybrid car in Malaysia. The finding of this study will allow to conclude that whether road tax exemption is one of the main drivers behind the adoption of hybrid car in Malaysia.

Import tax, sales tax and excise tax exemption: Excise duties can be explained as tax duties are levied on selected products produced locally or imported into Malaysia as prescribed in Section 6 of Excise Act 1976 (Miskam *et al.*, 2013). Sales tax can be defined as a tax or levy imposed by the government at the point of sales on retail goods or service. The import tax is a tax paid by importer in respect of goods in order to bring foreign goods into his or her country. During 2011, the Malaysian government announced that import duty and excise duty would be fully exempted for hybrid vehicles with an engine capacity <2 L. The sales of hybrid cars have dramatically increased. According the information provided by Malaysia Automotive Association, Malaysia's duties and tax structure consist of import duty, excise duty and sales tax. The deduction of any type of tax within duty and taxes on vehicle will directly influence the price of the vehicle. Several studies have been conducted to examine the effectiveness of excise tax on hybrid car adoption.

Gallagher and Muehlegger (2011) indicated that excise tax possess has a significant influence on

consumer adoption on hybrid vehicle technology. The finding of Bjart and Anders providing support to Gallagher and Muehlegger (2011) conclusion. They concluded that excise duties policy is able to contribute significantly on improving hybrid car acceptance. Ambarish indicated that sales tax reduction possesses is statistically significant on influencing the sales of hybrid car in Canada. Racher finding revealed that sales tax deduction significantly influence the sales of smaller cars in China's rural area. The deduction of tax tariffs including import tax, excise tax and sales tariff will decrease the price of hybrid cars in Malaysia. There will be greater probability for Malaysian consumers to have higher purchase intention towards adoption of hybrid technology cars. The results of this study contributes towards the academic literature in the researched area and also provides strategic information to the governmental or manufacturer in the reviewing of the tax policies related to excise tax, import tax and sales tax on imported hybrid vehicle in the future.

Income tax deduction: Income Tax can be explained as a government levy which imposed on individual that varies with the income or profits of the taxpayer. In the year 2000, United States federal, state and local governments imposed various sets of tax incentives to stimulate the sales of hybrid car. Those incentive including income tax rebate, waives of sales tax, waives of registration fee and free parking. The income tax incentive scheme provides income credit to the people who purchased hybrid cars which can be used to reduce income tax payment incurred from them. Numerous of aforementioned government policies are generous and worth approximately several thousand dollar. The tax incentive enables to reduce the increment cost associated with purchasing hybrid car (Gallagher and Muehlegger, 2011). Similar study were conducted by Beresteau and Li (2011) in the United States.

They discovered that the effect of income tax credit incentive contributed significantly to the growing market of hybrid cars. Their empirical results revealed that the income tax rebate incentive scheme contributed <5% of hybrid car sales from 2001-2005. They further indicated that more generous income tax incentive accounted for approximate 20% of hybrid car sales in 2006. In light of the tax incentive conducted by Metcalf (2008) revealed that the effectiveness of income tax incentive program on hybrid car is higher if compared with tax credit on ethanol from the perspective of government expenditures.

The Malaysian government has imposed income tax deduction on purchase of personal computer. According to the information provided by LHDNM (2011) up to

RM3,000 of income tax deductions for purchase of personal computers and claimable every once in 3 year. In addition, the Malaysian government extend the scope of income tax deduction to other purchasing field including sport equipment, support equipment (disable people) books, journals and publications (LHDNM, 2011). There is limited study in Malaysia to evaluate practicability of income tax deduction policies on improving the sales of hybrid cars in the domestic market. Therefore, the finding of this study enables to role play as guideline for policy makers on developing effective incentive program to improve hybrid adoption.

Chandra *et al.* (2009) explored the effectiveness of government incentives in improving the sales of hybrid vehicles in Canada. The results indicated that the government's rebate policy led to a large increase in the market's share of hybrid cars. There is an increased of approximately 26% of the hybrid cars sold during the rebate period. Berensteanu and Li (2011) explored the moderating effect of government incentives on hybrid vehicle buying decisions. The findings indicated that tax incentives have a significant positive influence on the sales of hybrid cars. A study conducted by Ozaki and Sevastyanova (2011) examined the 5 dimensions that constitute consumer's motivation to purchase the Toyota Prius and also identified the government policies which can motivate hybrid car adoption. The findings illustrated that financial benefits are strongly related to consumer's hybrid car buying intention. Lane and Potter (2007) stressed that financial benefits are a very important factor encouraging the adoption of environmentally friendly cars.

The empirical findings of this study will help researchers and government to gain a deeper understanding of the influence of policies on hybrid car buying intention. As a result of this study, the government and vehicle producers can cooperate to develop effective policies to enhance consumer's hybrid car adoption in Malaysia. This study will provide a guideline for the government when imposing various incentives for stimulating the sales of hybrid cars in the domestic market. The price of hybrid cars will increase sharply without the tax exemptions imposed by the government. The market situation for hybrid cars is difficult to predict without in-depth analyses of the influence of government policies on consumer's buying intentions for hybrid cars. Hybrid vehicle producers will lose their competitive advantage without the intervention from the government. This research will help to minimize the risk of product failure. In addition, the review of the findings of this study will allow hybrid vehicle producers to reduce overdependence on government policies to stimulate hybrid car sales in Malaysia.

CONCLUSION

This study attempts to explore the influence of governmental policies on consumer's purchasing intention towards hybrid car. Several new governmental policies elements including free parking fee, car price subsidization and road tax exemption are introduced into the study except for import tax and excise tax exemption. The finding of this study can be regarded as a valuable guideline for automotive policy makers in Malaysia. The government should manage car industry by providing tax incentive to consumers which may as well boost sales for hybrid cars. In addition, the results of the study enable to evaluate the effectiveness of on promoting hybrid cars purchases intentions and improving the penetration rate of hybrid cars in the domestic market.

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