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Should Automotive Firms Opt into Green Innovation?

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ABSTRACT

In recent years, increasing social, stakeholder, and regulatory pressures have pushed automotive firms to invest in green innovation in an attempt to lower their harmful effects on the environment. They may choose to either put resources into developing green initiatives or further develop their core competencies as a firm. Previous studies find positive correlation between green initiatives: green product innovation, green process innovation, green marketing, and green supply chain management with firm image, sustainable development, and financial performance. The study proposes a model to build a conceptual framework of ideal market and timing conditions when undergoing green innovation as an automotive firm as well as an application and implications of the concepts within the existing market and regulatory environment.

Introduction

Automobile production has steadily increased in recent years and will continue to do so as it enters developing markets. Alongside such increases in sales and production come increased emissions in the production and life cycle of automobiles that have the potential to cause environmental damage, raising concern on behalf of environmental conservation that automotive firms reduce their environmental footprint. This comes in part from the consumers themselves, who demonstrate their concern and commitment by being willing to pay a premium for green products over regular goods (Chen, 2008). Additionally, Provasnek et al., 2017 found that satisfying stakeholder demands is essential to a firm's success. Thus, automotive manufacturers face pressure to invest in green innovation, defined here as any adjustment to a business' products, supply chain management, or process, meaning their production and resource efficiency. This pressure arises from both their consumers through demand and governments through regulation. In many cases, subsidies or taxes imposed on automotive firms for either reaching or failing to reach regulatory eco-targets have a direct impact on the cost that consumers pay for their automobiles.

This paper looks at the issue of green innovation from the perspective of automotive manufacturing firms, who, looking forward, are faced with a decision to either invest in green innovation or improve their business' core competencies in order to gain competitive advantage. Currently, it seems that societal and government pressure will lead the majority of the world's largest firms to undergo green innovation to some degree; sometime between 2030-2040, most of if not all of newly sold automobiles will be electric or hybrid (Rowlatt, 2021). It seems, then, that investments in green innovation may be inevitable for automakers who must adapt to pressure and demand to succeed, but automakers have flexibility in choosing when, in what environment, and to what degree they do.

This paper will examine the sustainable development and financial implications of green innovation in the automotive sector as well as the conditions in which they are most viable. The paper contains a literature review followed by a qualitative model to describe the implications that green innovation (GI) has on firms and

what consumers look for when shopping for automobiles followed by an application of the discussed concepts in the current market.

Literature Review

Green innovation

Green innovation is defined as any business practice whose "main objectives are to minimize environmental hazards resulting from industrial manufacturing, strengthen the corporate competitive advantage, have significant ecological benefits, and promote the ecological economy" (Li et al, 2020), all while fulfilling the needs of the consumer at a level equal to or better than previous. Green initiatives within a firm include green process innovation, green product innovation, green management innovation, and green publicity. Green process innovation pertains to altering manufacturing processes to minimize harm to the environment (Gohoungodji et al, 2020). In application, this may pertain to increasing resource allocation and consumption to make more efficient use of energy, thereby reducing waste output. Green product innovation pertains to the development of products that have less harmful environmental effects throughout their life cycle. In the automotive industry, this takes the form of hybrid, electric, or more fuel-efficient vehicles created with the goal of emission reduction in mind. According to G.S. Kushwaha *et al, 2016*, Green Supply Chain Management (GSCM) is relevant to the automotive industry through its focus on life cycle costing, asset efficiency, waste reduction, service innovation and recycling. GSCM can facilitate product and service innovation, improve asset utilization, and solidify customer relationships through a mutual focus on reducing both waste and cost (Van den Broek and Van den Broek-Serle, 2010). Green publicity, or green marketing, is related to an adherence to ethical and social responsibility with regards to marketing and corporate image (G.S. Kushwaha *et al, 2016*). According to (Kotler et al, 1997), green marketing is described as the societal marketing concept which protects and develops the consumer's and society's welfare, specifies organization's needs, wishes, and intended population's interests and provides more productive and effective customer satisfaction for the firm than its rivals."

Current state of Green Innovation in the Automotive Sector

There has been an increase of concern over environmental issues such as air quality and global warming expressed by the government, firms, and the general public alike (Ottman, 2017). Luchs et al, 2010 and Mackoy et al, 1995 found that consumers claim that they are increasingly interested in products that cause less pollution, use fewer natural resources, and are less harmful to the environment. Furthermore, roughly 58% claim that they have experienced the effects of climate change, and that their government's efforts to address them are not sufficient, despite the current regulations and taxes that the government places on OEMs, or original equipment manufacturers (Funk et al, 2020). A study which interviewed over 700 CEO's globally found that 93% feel sustainability programs that are aligned with their core business models are key to the future success of their business (Borin et al, 2011). According to National Geographic, automotive vehicles produce roughly one-third of all United States air pollution ("The environmental impacts of cars, explained, 2019). Furthermore, according to (The U.S. Environmental Proection Agency, epa.gov), roughly 24% of greenhouse gas emissions from the economic sector come from industry, to which the automotive sector contributes greatly. According to the NHTSA, the National Highway Traffic Safety Administration, 'if the average fuel economy of a manufacturer's annual fleet of car and/or truck production falls below the defined standard, the manufacturer must pay a penalty, currently $5.50 USD per 0.1 mpg under the standard, multiplied by the manufacturer's total production for the U.S. domestic market' (www.nhtsa.gov).Thus, government regulation and social pressures to undergo green initiatives fall on sectors with high environmental costs, like the automotive OEMs which are

the focus of this paper. Already, 12 various automotive OEMs plan to go completely electric by 2035 (Duffy, 2022).

This paper focuses on car OEMs that are faced with the decision to phase out of the use of internal combustion engines (excluding major players like Tesla who have roughly a 16% market share in the EV industry and have been focused on EV's since their inception (Kane et al, 2022) and the decisions that they are faced with heading into the future.

Green innovation from the consumers' perspective

Consumers show increasing concern for the environment and green innovation: according to Chen, 2008, consumers are increasingly willing to choose green products and pay increased prices for them. Furthermore, 83% of consumers today are green to some extent (Ottman, 2017) further revealing their concern and growing awareness. Green consumers are not willing to purchase green products just for the sake of environmental benefit alone; they seek products that better their health, financial status, or simply products that work better than before.

In the automotive sector, consumers who are looking to invest in green products, the majority of which are hybrid, plug-in, or electric vehicles, face the issues of cost premium and limited infrastructure and support, both in servicing and charging. This means that green consumers will only invest in green products that meet their basic, environmental, and financial automotive concerns. These concerns include quality, reliability, performance, and cost, as well as reduction of pollution, increased social status, and fuel efficiency. Green consumers must still seek benefit that outweighs the risks that they face when purchasing a green automobile.

Despite consumers' growing concern for the environment, there is a disparity between the consumers' positive attitudes towards green products and the rate at which they adopt them, (Trudel and Cotte 2009). There are various categories of barriers to the adoption of green products which will be the focus of a later section.

Green innovation from the firms' perspectives

Thus, such automotive manufacturers are currently faced with two main choices. They may either focus on furthering their traditional core competencies: the quality of their products, services, and marketing, or undergo an investment in their green core competencies in response to a pull from consumers, governments, and society at large. This study seeks to weigh the barriers to green innovation faced by automotive manufacturers against the implications that green innovation, which includes green process, product, and management innovation, may have on competitive advantage, firm performance, and sustainable development. Following these key variables will be discussion of mediating factors which can augment the effectiveness of green innovation as well as the implications that the current literature reviewed for this study have for the ways in which governments may effectively regulate and support green innovation within the automotive industry.

Barriers to Green Innovation

Gohoungodji et al, 2020 have identified six main categories of barriers to green innovation in the automotive industry: those related to resources, behaviors, information/lack thereof, technology, organization, laws, and regulation. Resource barriers include the unavailability of human capital, material, financial weakness, time constraints, or difficulties in accessing finance. Behavioral barriers include the attitude of managers, employees, or stakeholders which can aid or inhibit innovation. This may specifically pertain to resistance, passivity, reactivity, or inactivity in relation to green innovation initiatives. Informational barriers cover the consumer's lack of access to information covering the procedure, technology, and organizational data surrounding GI and firms which undergo GI. Technological barriers are related to a lack of method, procedure, technical knowledge, or

performance of GI technology. Organizational barriers include the relationship between OEMs and suppliers, stakeholders, consumers, and governments, all of which have variance based on location. Laws and regulations-based barriers include the disparity between collaborating countries in laws and regulations, which can disrupt the supply chain. The applications of such barriers will be discussed further.

2.6 Firm Management Implications

Competitive Advantage

Alongside the rising social and regulation pressure to undergo green innovation is the clever message that there is strong demand for green innovation initiatives, which may help participating firms gain a competitive advantage. According to Chen, 2008, OEMs that develop their green core competencies, or green innovation capabilities, may increase productivity through resource efficiency and first mover advantage, allowing them to differentiate their products and charge higher prices to offset the cost of hiring and R&D. Furthermore, firms that comply with environmental regulations can avoid tax penalties which may otherwise have the potential to impede growth.

Firm Performance

Existing literature debates the potential benefits of green innovation: some authors claim the potential for "win-win situations" (Zailani et al, 2015), an opportunity to further economic and environmental development. Others see corporate green innovation initiatives as a compromise both to firm performance and environmental performance: an unnecessary risk investing in both infrastructure and research and development. Firm performance is defined by (Kushwaha et al, 2016) based on three main criteria: a firm's financial, operational, and marketing capabilities. Environmental performance refers to the environmental benefit that is realized through green innovation initiatives, or GIIs. A study conducted by (Chen, 2008) found that green innovation performance is positively connected to green images, meaning that the green innovation performance improves the green image of any given firm. Using a quantitative model, (Kushwaha et al, 2016) found that green marketing strategy positively affects green supply chain management and subsequently financial performance. (Lin et al, 2019), found that green innovation strategy positively affected corporate financial performance. Furthermore, Green reverse logistics, which are central to green supply chain management, are also utilized by automotive OEMs such as Toyota, Honda, Ford, etc. in an effective manner of waste management. Studies conducted by (Borin et al, 2011) and (Chan et al, 2012), found that firm performance, previously defined by financial, marketing, and operational factors, was improved by green innovation initiatives.

Sustainable Development

As defined by the Brundtland Commission (Chichilnisky, 1997), sustainable development is "development that satisfies the needs of the present without compromising the needs of the future". This paper will build on that definition to establish sustainable development as development which ensures economic and social development with minimal compromise to environmental consequence. A literature review conducted by (Kushwaha et al, 2016) found that, not only do current authors find that green innovation initiatives reduce carbon footprint, but they also find that it may directly lead to sustainable development.

Mediating Factors

Up to this point, the literature finds that green innovation initiatives are beneficial for establishing competitive advantage, furthering firm performance, and aiding in future sustainable development. However, the extent to which different green innovation initiatives may affect these business advantages depends on key mediating factors or variables.

An empirical study conducted by (Lin et al, 2019) found, as stated earlier, that corporate financial performance was enhanced by green innovation strategy. Furthermore, they found that firm size was a moderating factor in the correlation between the two factors. Small sized firms, in fact, showed higher return on investment with regard to green innovation strategy R&D. The findings theorize that smaller firms may be more flexible in adjusting research plans or implementation, and that they are more flexible in creating employee incentives and can devote more time to innovation for lack of rigid management.

(Gershoff and Frels, 2015) found that consumer perception of the environmental effect of green products may be influenced heavily by how central the green innovation within any given product is to the product. In the context of the automotive industry, manufacturers are constantly trying to innovate more fuel efficient cars. If one of their innovative cars increased fuel efficiency through aerodynamic adjustments and another increased fuel efficiency to an equal degree by using a hybrid engine, consumers would perceive the latter as more environmentally friendly since the engine is seen as more of an integral or central part to the functioning of the vehicle.

Government regulation was found by (Gosh et al, 2020) to be effective in forcing OEMs to participate in GIIs, but its effect was limited under certain conditions. The natural cost difference of undergoing "greening" makes it so that high greening cost firms will be affected poorly, whereas low greening cost firms will gain a competitive advantage, which would not fulfill the goal of overall promotion of green innovation. Furthermore, the stricter the government is in issuing regulation (i.e., the more subsidies they give and the more taxes they levy for compliance or meeting environmental standards or lack thereof), the larger the
"greening" gap between firms would be, and the larger performance gap between firms as well.

Similarly, a study conducted by (Baoshan et al, 2018) found that green innovation implementation viability depends on variance in environmental uncertainty. In situations of low environmental uncertainty, the dynamic capabilities of a firm play a mediating role between green innovation and sustainable competitive advantages, but the role of dynamic capabilities as a mediator disappears in high uncertainty environments.

Regulatory Implications

OEM Implications

Overall, the current literature supports the idea that green innovation is positive for long term firm performance, sustainable development, and competitive advantage so long as firms keep mediating factors in mind. In addition to such mediating factors which can influence the viability of undergoing green innovation are those that are a direct result of it. A study conducted by (White et al, 2019) found that green innovation may help motivate employees and develop a more positive social and brand image.

Government Implications

Although the current literature supports the potential viability of green innovation in the automotive sector, a study conducted by (Chen, 2001) finds that strict environmental regulation may not always lead to the desired environmental performance. For example, in many cases companies which are forced to adhere to strict emissions and efficiency standards will be in a "green targeting" phase (Durmaz et al, 2016), meaning that they will continue to develop their non-green products in addition to their new environmentally friendly ones. In many cases, they conclude that firms may decrease the efficiency or greenness of other products to make their green products seem more appealing while meeting emissions regulations. This finding highlights the importance in government regulation and support of green innovation in making sure to evaluate environmental performance in terms aggregate statistics, like average fuel economy, for example.

Model

Background and Introduction

In this section, we are presenting a model in which an automotive firm makes a decision on whether or not to undergo green innovation from a financial perspective, in both the short and long term. The scenario we consider excludes OEMs which are already dedicated to or focused on green innovation. The model relates as follows: firms may either opt into green innovation (hence GI in the rest of this paper), or they can focus on traditional development of their supply chain and core competencies. If they do opt into GI, then the degree to which they invest in it varies, which brings up three phases of green innovation which will be established in this paper. Firms that invest in GI will incur extra types of short term cost (C_{GIs}) over firms which do not, whose costs will be (variable for non-GI cost). The costs for both types of firms include research and development, salaries paid to employees, new infrastructure, as well as all costs of production for the automotive manufacturer's production, sales, and marketing. P_s represents the short-term aggregate price that a firm who does not opt into green innovation may charge for their products, while P_{GIs} represents the short-term aggregate cost of products for those who do. Thus, the model was created to capture the relationship between cost, price, revenue, and profit between firms which do and do not invest in green innovation over varying periods of time and market conditions.

This section discusses the effects of Green Innovation adoption on the following variables which represent any given firm's short term cost (C_s,), short term GI cost (C_{GIs}), long term cost (C_L), long term GI cost (C_{GIL}), short term price (P_s), short term GI price (P_{GIs}), long term price (P_L), long term GI price (P_{GIL}), etc. for demand, D_s, D_L, D_{GIs}, D_{GIL} . All variables which contain GI signifies the cost, price, or demand for firms that opt into green innovation, whereas those that do not contain it pertain to firms that do not.

Firm decisions

The model recognizes the two main types of decisions that automotive manufacturers are faced with - whether to invest in GI, and the timing with which they choose to do so. However, there are variables which are affected by the GI choice, such as demand D, which can in turn affect financial outcome and will be discussed in a further section detailing the supply and demand implications of GI.

Firm utility

Firms look to maximize profit under the rationality assumption and firm production theory; thus, the model will be constructed under the basic framework of profit, revenue, and cost. Revenue is represented by P, the aggregate price of a firm's automobile sales, whereas C is the overall cost incurred when producing and selling those automobiles.

Profit = Revenue - Cost

Profit = R – C

Supply-Demand Implications

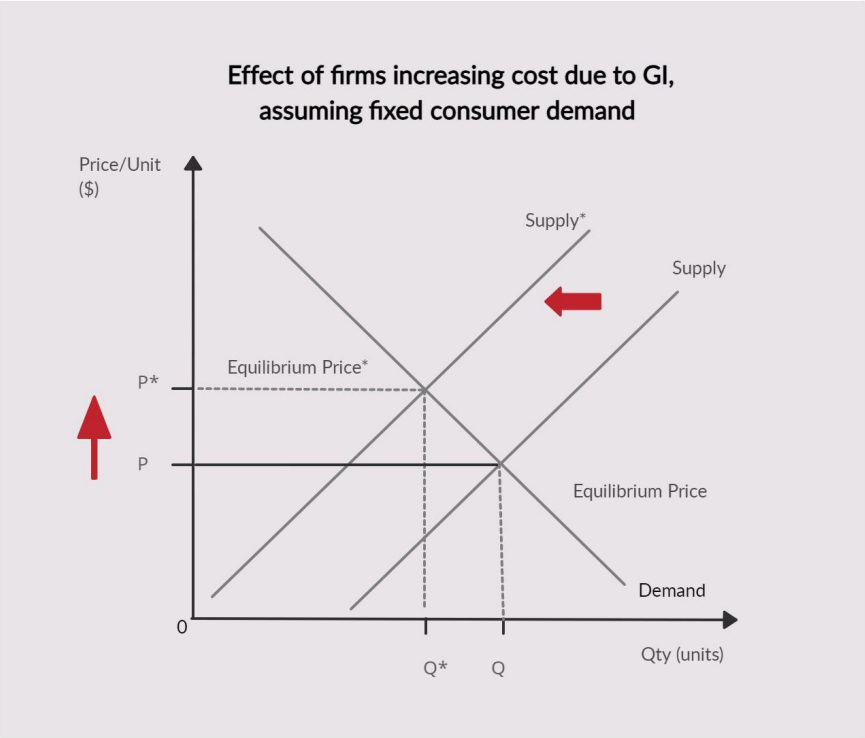

Figure 1. Effect of firms increasing cost due to green innovation, assuming fixed consumer demand. Q represents initial quantity exchanged, Q* represents final quantity exchanged, P represents initial price of product, P* represents the final price of the product.

Figure 1 represents the impact of increased firm costs that are a direct result of green innovation investments. In this case, a firm which invests in GI will incur an increased cost, C_{GIs}, effectively increasing their production costs, which results in a decrease in overall production output and therefore a decrease in supply, shifting the supply curve and setting a new equilibrium where Quantity exchanged decreases but price per unit, P_{GIs}, increases.

This graph may also detail a situation in which firms have just begun to invest in GI and there are few producers of GI automobiles, causing supply to be low. If we consider the trend of GI consumers against time shown earlier and assume that some portion of those consumers will exclusively consider GI automobiles once they become available, then the market of firms available for the consumer to purchase from in this early stage is low, effectively a decrease in the amount of firms and therefore overall supply of such consumers compared to when they were open to purchasing vehicles from non-GI automobile firms. This consumer preference creates an artificially low supply and once again will result in quantity exchanged decreasing and P_{GIs} increasing.

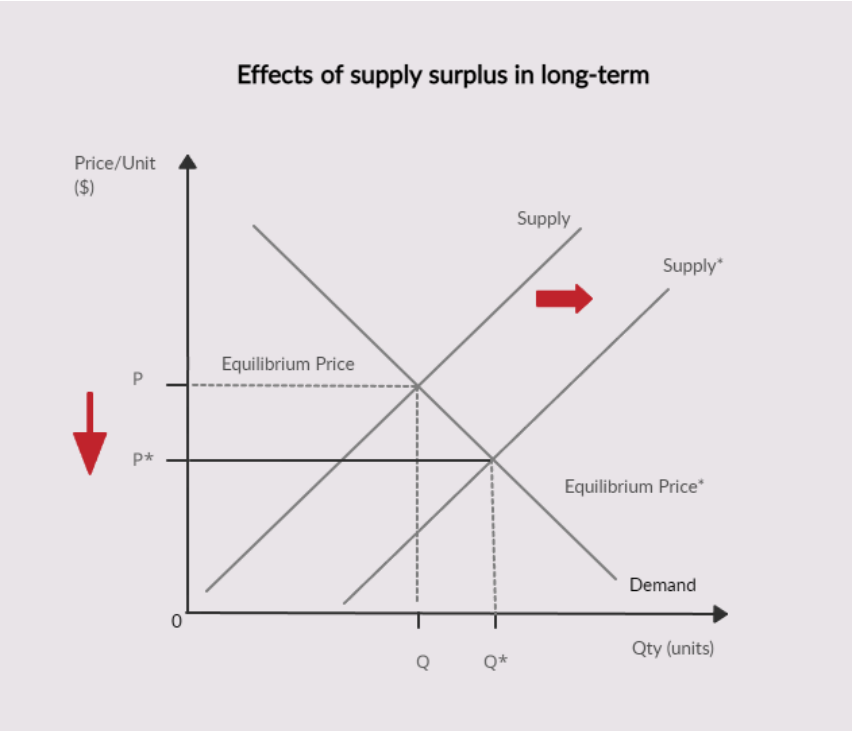

Figure 2. Effect of firms' supply surplus in long-term. Q represents initial quantity exchanged, Q* represents final quantity exchanged, P represents initial price of product, P* represents the final price of the product.

Firms that invest in green innovation, specifically green process innovation, will become more efficient with resources, eventually reaching a point where their effective cost of production will be lowered, thus increasing supply, decreasing price, P_{GIL}, and increasing quantity exchanged, or volume. In the long run, the number of sellers of GI automobiles will increase, thus increasing supply.

A similar trend occurs when considering the effects of government regulation, or environmental taxes or subsidies for firms that do or do not reach environmental targets. If firms are incentivized directly for making eco-targets, then their production and net supply will increase.

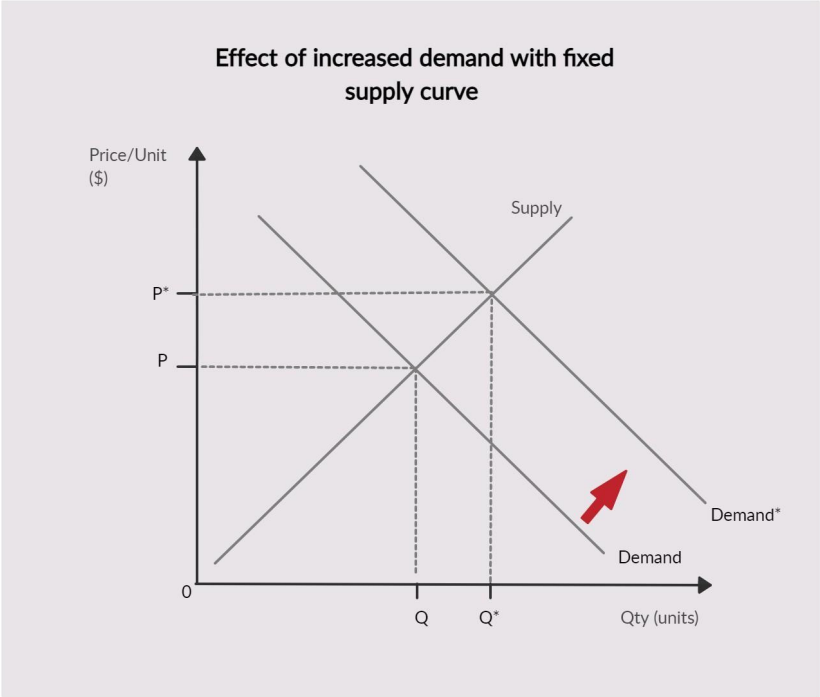

Figure 3. Effect of government subsidies and tax payouts. Q represents initial quantity exchanged, Q* represents final quantity exchanged, P represents initial price of product, P* represents the final price of the product.

Government subsidy and tax payouts go directly into the pocket of the consumers, effectively lowering the price of a GI vehicle for the consumer with no negatives to the firms, who still receive full price for their vehicles which may create artificially increased demand that may lead to overall increase in both price and quantity exchanged.

In accordance with the consumer trends relating to GI automobiles discussed earlier, demand for GI automobiles will increase in the future, resulting in an increased price and quantity exchanged.

If, by the time a late adopting firm invests in GI, other existing GI firms have already reaped the benefits of GI (lowered production costs, etc.), then the price of their products is likely to be lowered, causing an increase of demand. This may create an issue for late adopting firms that have trouble selling their expensive automobiles and getting off the ground, suggesting another advantage to innovating early on.

Time as a mediating factor to financial performance

When thinking about financial performance, firms care about both short- and long-term goals. When starting from zero, automotive OEMs must put forth a large investment, as a result C_{GIs} will be increased, and the short-term profit as well as revenue may also decrease when other factors are fixed. However, as a GI firm develops its infrastructure, facilities, and green supply chain, we argue that the sustained cost of operation, that is C_{GIL}, should be lowered given their revamped resource efficiencies and cost savings. Government subsidies and restrictions, which have and will greatly increase in the future, serve as another incentive towards GI, as firms which meet the environmental standards will either dodge heightened taxes, gain subsidies, or both.

Furthermore, firms that invest in green innovation have an opportunity to build their reputation in the long term via acts of social responsibility. (Chen, 2008) and (White et al, 2019) found that GI has a positive relationship with green image, which also has a positive relationship with financial performance.

How do automotive consumers make decisions on green innovation products, GIPs

As opposed to firms, whose main goal is now centered around sustainable development that leads to financial performance, consumers consider a wide array of qualities within an automobile that can be modeled with the equation:

Utility function for consumers U = f(x), where x represents the factors that consumers consider when they are looking to purchase an automobile. Such factors modeled by x include quality, price, efficiency, low maintenance costs, reliability, and government tax incentives.

The future of Green Innovation in automotive manufacturing

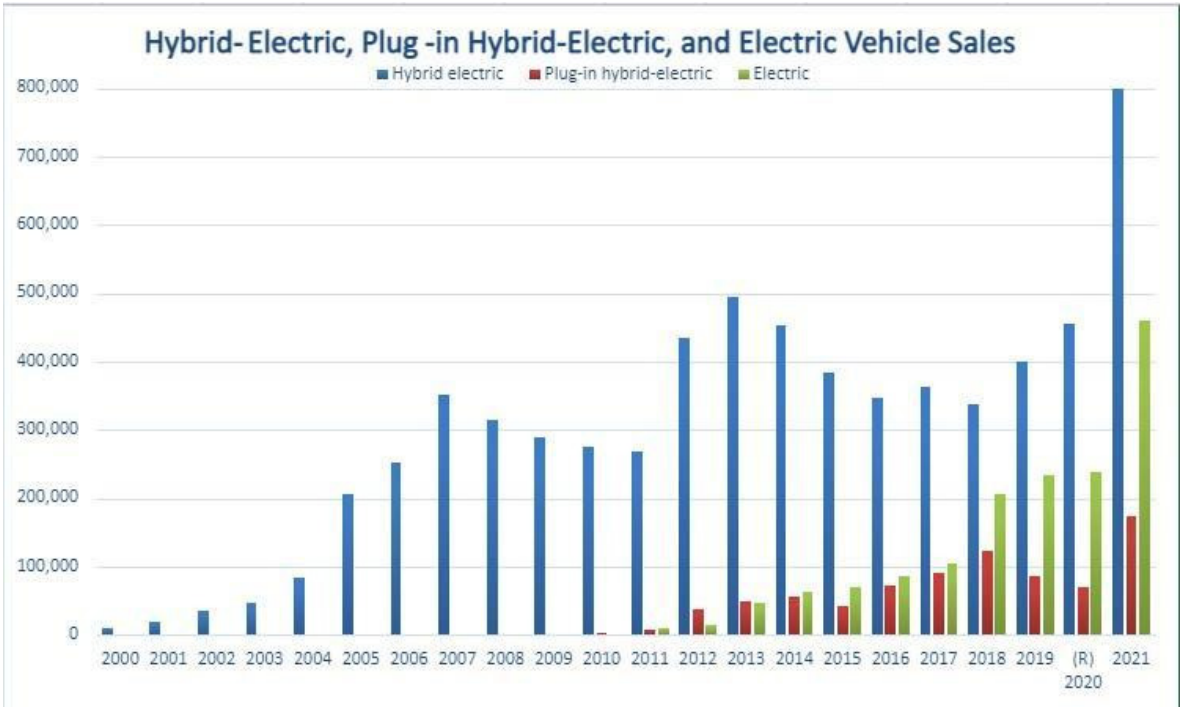

Figure 4. (Bureau of Transportation Statistics)

Already the market shows significant development of green automobile formats that barely existed just ten years prior. Green automobiles' rise to prominence raises importance both for manufacturers and firms who must make decisions when producing and buying them.

Future of green regulation and development in the automotive sector

Current state of government regulation

Currently, governments across the world, such as the United States, UK, Japan, and China currently support the research and development of electric vehicles ("Clean Air Strategy" 2019 and "Government Launches Road to Zero Strategy to Lead the World in Zero Emission Vehicle Technology" and Ahman, 2006). Oftentimes this is through direct financial contribution to research or through infrastructural development. For example, the

United Kingdom's government contributes to the construction of chargepoint locations in an attempt to incentivize the production of electric vehicles. Other traditional incentives include charge exemptions and tax advantages to lower the adoption cost for consumers (Davies et al, 2016, Yong et al, 2017, and "Vehicles Exempt from Vehicle Tax."). A similar financial benefit is shown in Norway, where electric vehicles are less expensive to import than traditional combustion cars ("Norwegian EV Policy."). Alternative incentives, such as one offered in China, may include preferential treatment or accessibility to roads for electric vehicle-owners (Davies, 2016). This benefit is primarily temporary, as the benefit of having EV-only roads will diminish as the number of EVs increases up to the point where there is no benefit at all.

Future Concerns

Alongside the evolving market of green automobiles are the new regulations that must be passed in response, many of which are of concern to auto manufacturers. Although governments such as the UK currently give financial aid in the development of EV infrastructure such as charge points, they may have a hard time determining which companies to invest in. Furthermore, in expanding their infrastructure, chargepoint manufacturers must branch out of the large cities that they primarily operate within. In many cases, rural areas do not have the same density of charge points when compared to cities ("Clean Air Strategy 2019"). In many cases, chargepoint companies will be forced to undertake a degree of uncertainty when expanding into other more rural demographics. Thus, automotive manufactures may want to adjust their timelines when thinking about EV adoption.

Although current regulations on EV batteries and battery recyclability do not exist, it is probable that they will in the future. This raises concern for manufacturers regarding sourcing raw materials, as one of the main components in EV battery production, cobalt, can be sourced frequently in areas that use child labor ("Exposed: Child Labour behind Smart Phone and Electric Car Batteries."). This raises a clear ethical concern and a potential pitfall for a manufacturer's brand image, especially as a sustainable and socially positive company.

Manufacturers must also consider the future probability of battery recyclability regulations when designing their products, which may incur additional research costs either proactively or later down the road.

Practical application of concepts for consumers

When making purchasing decisions, green consumers must be aware of the different ways that manufacturers take part in green initiatives as well as the ways in which they market them. As discussed earlier, a study conducted by Gershoff and Frels, 2015 found that the centrality of any given green innovation to the overall product or company that contains it has a significant impact on how green consumers view it as. Furthermore, there are various ways that firms commit to green innovation - not just through product innovation. In many cases, consumers are unaware of a firm's green initiatives because they are not seen as central to their products; green process innovation and green supply chain management do not often show up in the marketing process of a car as much as the central green product innovation that pertains to it.

Internal combustion engines and electric motors are essential to the car that they power. Recent investments and uptake of green automobiles, primarily hybrid and electric are seen as a
step towards sustainability and environmentally friendly transportation (Martins et al, 2021 and Peters et al, 2014). This may lead consumers to believe that the net environmental effect of an electric car outweighs that of any internal combustion-engine car simply because it is electric. For example, Tesla, an automotive manufacturer that solely produces electric cars, may be seen as more beneficial to the environment than a company like Toyota, which produces primarily internal combustion engine cars that release more emissions throughout their lifecycle than do Teslas. Tesla is seen as one of most sustainable car manufacturers, or even companies,

in the world (Kastos, 2018). However, consumers may not be considering a manufacturer's supply chain or production process. While it is true that electric vehicles are generally more environmentally friendly throughout their lifecycle than traditional combustion cars, roughly 77.6% of electricity used to power electric vehicles comes from oil, gas, or coal (Kastos, 2018). Additionally, Tesla scraps roughly 40% of their raw materials, which is notably higher than other companies, regardless of whether they produce electric vehicles (Linette, 2018).

On the other hand, a company like Toyota produces primarily internal combustion engines, and therefore puts comparatively less resources into green product innovation and lifecycle emissions reduction. Since their green initiatives are seen as less central to their products, Toyota may not be seen as a green company because their primary environmental initiatives involve process innovation. For example, one of Toyota's engineering specialists discovered the ideal solvent concentration for cleaning their production equipment, leading to a reduction in chemical and water waste as well as a reduced amount of defective bumpers, further reducing their environmental impact ("Video Library").

Conclusions

The literature review finds positive correlation between green innovation initiatives and firm performance/sustainable development. It seems as though firms have little choice in ultimately investing in green innovation, though there seems to be merit to the first mover advantage through the lens of the qualitative model. Additionally, there are various market and environmental conditions that firms should assess when deciding the timing of green innovation investments.

This study was limited by access to data such as any given companies' aggregate revenue, profit, and production costs. Furthermore, the study was limited based on resources, as a field study which considered the variable of GI and its effect on firm performance and sustainable development would have been ideal.

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