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**„Corporate Social Responsibility, A Red Queen Effect?
Evidences from the U.S. Electric Vehicle Market“**

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ABSTRACT

The purpose of this master's thesis is to shed a light to the relationship between corporate social responsibility (CSR) and competition from the Red Queen Effect (RQE) perspective. Particularly over last three decades, it has been a popular matter of debate, whether CSR can be used as a strategic tool with respect to firm's long term goals. To assign the strategic position of the firm, CSR should trigger innovations and create variation. On the other hand, the RQE reflects a continual and dynamic co-evolutionary process, where the competitors reciprocally trigger the adaptation and competitiveness of each other. If one of the competitors gained a competitive advantage, the others are likely to react and thus, this advantage may be lost. Through asking whether CSR is a RQE, it is inquired in this master's thesis whether CSR is disseminated easily among competitors or whether CSR is a source of sustainable competitive advantage. To respond to these questions, the competition driven over characteristics of electric vehicles (an example of strategic CSR) in the U.S. market is examined.

ABSTRAKT

Das Ziel der vorliegenden Masterarbeit ist es, den Zusammenhang zwischen der Corporate Social Responsibility (CSR) und dem Wettbewerb aus der Perspektive des Red Queen Effekt (RQE) zu ergründen. Insbesondere in den letzten drei Jahrzehnten war die Frage, ob CSR in Bezug auf die langfristigen Ziele eines Unternehmens als strategisches Instrument eingesetzt werden könnte, ein beliebter Gegenstand von Diskussionen. CSR sollte dabei Innovationen auslösen und Variationen schaffen, um die strategische Position eines Unternehmens zu bestimmen. Dahingegen spiegelt der RQE einen kontinuierlichen und dynamischen Prozess der Koevolution wider, in welchem die Wettbewerber gegenseitig die Anpassung und Wettbewerbsfähigkeit von einander antreiben. Wenn einer der Wettbewerber einen Wettbewerbsvorteil erlangen würde, werden die anderen darauf wahrscheinlich reagieren, wodurch dieser Vorteil verloren gehen könnte. Durch die Fragestellung, ob CSR ein Red Queen Effekt ist, wird in dieser Arbeit ferner untersucht, ob CSR unter Mitbewerbern verbreitet oder ob CSR eine Quelle nachhaltigen Wettbewerbsvorteils ist. Um diese Fragen zu beantworten, wird der Wettbewerb über die Eigenschaften von Elektrofahrzeugen (ein Beispiel für strategische CSR) auf dem US-Markt untersucht.

Table of Contents

<i>Table of Contents</i>	<i>iv</i>
List of Figures and Tables	v
Abbreviations	vi
1. INTRODUCTION	1
2. THE RED QUEEN EFFECT	4
2.1. The Story and the Red Queen Analogy	4
2.2. The Evolutionary Mechanism in Economics	6
2.2.1. Innovation as the Main Dynamic of Evolution	8
2.2.2. Innovation and Competition	10
2.2.3. Innovation and Co-evolution	13
2.3. The RQE and Organizational Characteristics	14
2.2.3. Sustainable Competitive Advantage	19
2.4. Formulation of Questions	21
3. CORPORATE SOCIAL RESPONSIBILITY	23
3.1. The History of CSR	23
3.2. Definition of CSR	27
3.3. Theoretical Approaches	29
3.4. The Arguments Against CSR	30
4. CSR and COMPETITION	33
4.2. CSP and Strategic CSR: Boundaries	34
4.3. Value Creation via CSR	37
4.4. Strategic CSR Arguments and the RQE	40
4.4.1. Differentiation	40
4.4.2. Reputation and Disclosure	42
4.4.3. Politics	44
4.4.4. Sustainability	46
4.5. Innovativeness of CSR	48
5. ELECTRIC VEHICLES (EV)	51
5.1. EV as a CSR Initiative	51
5.2. Global Markets and main characteristics of EVs	52
5.3. Key Challenges	55
5.3.1. Driving Ranges	56
5.3.2. Recharge Time	56
5.3.3. Total Costs of Ownership	57
5.3.4. Implicit Carbon Emissions	58
5.4. Analysis of EV Market in the U.S.	59
5.4.1. Driving Ranges	59
5.4.2. Battery Specific Energy	62
5.4.3. Recharge Time	64
5.4.4. Sales in the EV Market	67
5.5. Discussions	68
6. CONCLUSION	73
REFERENCES	75
APPENDIX	84

List of Figures and Tables

Figures

Figure 1.	<i>The Evolutionary Mechanism (Foster and Metcalfe 2003)</i>	7
Figure 2.	<i>Red Queen Among Two Organizations (Barnett 2008)</i>	15
Figure 3.	<i>Four components of Competitive Context (Porter and Kramer 2006)</i>	38
Figure 4.	<i>Electric Cars Stock (EV Outlook 2017 (IEA))</i>	54
Figure 5.	<i>Vehicle Stock by 2030 (IRENA 2015)</i>	55
Figure 6.	<i>Global Warming Emissions (Nealer et al 2015)</i>	58
Figure 7.	<i>Driving Ranges BEVs</i>	60
Figure 8.	<i>Driving Ranges PHEVs</i>	61
Figure 9.	<i>Coefficient of Variation: Driving Range</i>	61
Figure 10.	<i>Battery Specific Energy BEVs</i>	62
Figure 11.	<i>Battery Specific Energy PHEVs</i>	63
Figure 12.	<i>Coefficient of Variation: Battery Specific Energy (BSE)</i>	64
Figure 13.	<i>Recharge Time at 240 volt BEVs</i>	65
Figure 14.	<i>Recharge Time at 240 volt PHEVs</i>	65
Figure 15.	<i>Coefficient of Variation: Recharge Times</i>	66

Tables

Table 1.	<i>Four stages of CSR (Frederick 2006)</i>	24
Table 2.	<i>Comparison of TCOs (EV Market Outlook 2013)</i>	57

Abbreviations

CSR	Corporate Social Responsibility
SCA	Sustainable Competitive Advantage
EV	Electric Vehicle
BEV	Battery Electric Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
RBV	Resource-Based View
IO	Industrial Organization
ICE	Internal Combustion Engine
RQE	Red Queen Effect
GHG	Greenhouse Gas
CSP	Corporate Social Performance
CFP	Corporate Financial Performance
NGO	Non-governmental Organizations
WCED	World Commission on Environment and Development
CSI	Corporate Social Innovation
CSE	Corporate Social Entrepreneurship
HEV	Hybrid Electric Vehicle
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
TCO	Total Costs of Ownership
CV	Coefficient of Variation
V2G	Vehicles to Grid
BoP	Bottom of the Pyramid
MNE	Multinational Entities

1. INTRODUCTION

Corporate social responsibility (CSR) has been among the most popular issues of academia and business over almost half a century. The realm of CSR has been discussed in terms of its several dimensions and definitions while its content has concurrently transformed within time. For instance, the focus of debates was whether CSR is a normative case in 1950s and this focus shifted to the empirical studies over the relationship between social performance and financial outcomes in 1970s and 1980s. CSR turned to a mainstream activity in 1990s despite dichotomous objections upon that CSR is costly and is a task of government, but not of business. However, even there was an ambiguity about the relationship between social performances and financial outcomes, it is questionable why those large corporations paid a special attention to CSR. In 1990s, many academicians presented their supporting arguments to CSR that strongly suggested it as a tool for strategic positioning. Besides that, rather than traditional management concept based on profit maximization, corporations started to change their managing perspective to the favor of long run interests in those years. The arguments such as sustainability and political activism enforced the business to consider on long run objectives even at the expense of short run profits.

The studies upon CSR are commonly based on the relationship between social performance and outcomes, however the results are equivocal and there is no consensus over a positive correlation between social performance and financial outcomes. Furthermore, to put across that CSR is good for business, there is a need for works from different perspectives (McWilliams and Siegel 2011). Red Queen Effect (RQE) presents an alternative approach pertaining to competition. The notion that hails from the famous book of Lewis Carroll (1965) first used in biology and then inspired many academicians from several disciplines. In economics, it basically refers to a perpetual arms' race among large corporations. If a competitor makes a destructive change, it may bring a competitive advantage. However, the variation created through such a destructive change (innovation) is likely to vanish again. Rivals react to such a change through several ways (through learning, imitating or even through another innovation). Thus, the system (market or industry) is evolved and competitors come to new performance equilibrium in a superior level. Properly, through asking whether CSR is a RQE, it is aimed to trace whether CSR is easily disseminated or to be duplicable for rivals. In contemporary business, it is indeed obvious that such a competitive advantage would disappear ultimately, however this question aims to understand

to what extent CSR is fruitful and also to what extent a value creation is possible through CSR.

RQE is indeed not a theory. This concept may connote different approaches to each academician. Delacour and Liarte (2012) affirm that RQE bridges the Schumpeterian and Austrian approaches with organizational learning and organizational ecology. In this master's thesis, RQE is handled as an amalgam of evolutionary econometrics, organizational learning and resource-based view (RBV). Evolutionary economics perspective reflects the Schumpeterian approach and has of importance since it has strong emphasis on variation mechanism and selection. On the other hand, RBV contends how a sustainable competitive advantage (henceforth SCA) can be generated and it sounds antonym to the RQE. Thus, it sounds identical to say there is no RQE or there is a SCA. Organizational learning is important because of its emphasis on dyadic relationships and learning through competition. Relying on this theoretical background, three questions are asked: (1) Does CSR have a destructive impact? (2) Is CSR easy to respond? (3) Does CSR bring a SCA? These questions are elaborated in the end of the second section.

Despite the fact that CSR is handled by different approaches, the RQE and CSR are hardly mentioned together. This indeed reflects the originality of this thesis. Besides that, two perspectives have strong emphasis on the relationship between CSR and competition: RBV and Industrial Organization (IO) perspective (Porter and co-authors). In this master's thesis these ideas are also strongly mentioned. As a departure point, CSR is supposed as a strategic tool determined in accordance with the firm's own resources and capabilities as well as with competitive environment. Each firm may have different priorities and may assign a CSR policy in this regard. Each of various policies is likely sector-specific. Thus, it makes sense to conduct an analysis through such an example. Electric vehicles (EVs) is a remarkable example since it reflects the challenge of car manufacturing industry against sustainability concerns. EVs gained more importance among the competitors in the sector as of the establishment of Toyota Prius against concerns over greenhouse gas (GHG) emissions in 1997. This innovative action slightly changed the industry. Over two decades, car manufacturing industry has devoted its attention to those new type of cars. However, despite the effort in the entire sector, there is still a remarkable gap between the performances of EVs and conventional internal combustion engine (ICE) cars. Accordingly, EV manufacturers concentrate on to improve performance particularly in three fields: Total Costs of Ownership (TCO), driving ranges and recharge times. Alongside the flock in the sector through new

entrances, the established firms drive an arms' race with respect to these characteristics. Furthermore, it is also examined, what mechanisms and reasons of this transformation there are.

Finally, the structure of this thesis is as following: In the second section, the theoretical background of the RQE is presented as an amalgam of evolutionary economics, organizational learning and RBV. In the third section, the definitions and history of CSR as well as the opposing arguments of CSR are presented. In the fourth section, the relationship of CSR with competition, the value creation process through CSR and influence of CSR in terms of CSR arguments is presented. In the fifth section, the transformation in EV global markets, main challenges as well as the analysis of the market regarding to those challenges is presented. This section is concluded with discussions and the thesis is summed up with conclusion.

2. THE RED QUEEN EFFECT

2.1. The Story and the Red Queen Analogy

The name of Red Queen hails from the famous book of Lewis Carroll “Through the Looking Glass”, the sequel to ‘Alice in the Wonderland’ (Carroll 1965). Red Queen, indeed a chess piece in red color, is a character in the fantastic land of ‘Looking Glass’. Alice meets Red Queen here, after she coincidentally enters into the looking glass in her room. According to the story, the looking glass in the Alice’s room is another country, where everything is same as in her room, except everything goes in another way. The “Looking Glass” is such a country, where flowers can move, chessmen have ability of speech like human and many fantastic figures have different, surprising talents, as well. Beyond that, which makes “Looking Glass” special is that it is a very fast sort of country.

After seeing very interesting and surprising figures in the ‘Looking Glass’, Alice encounters Red Queen as she talks with flowers in the fantastic garden. Following to a short speech, they decide to go to the top of the hill above this fantastic garden. At the top of the hill, Alice realizes that this country is squared off and divided by brooks in different sections. As looking from there, the country indeed looks like a chessboard. Alice thinks she can involve to this game too and if it would be possible, she wanted to be a queen (like Red Queen). The story goes on so:

She glanced rather shyly at the real Queen as she said this, but her companion only smiled pleasantly, and said, ‘That’s easily managed. You can be the White Queen’s Pawn, if you like, as Lily’s too young to play; and you’re in the Second Square to begin with: when you get to the Eighth Square you’ll be a Queen’

Following this short conversation, Red Queen and Alice suddenly start to run hand in hand. After running for a very long time, Alice realizes that the surround is still same, and they are even under the same tree. Then Alice asks:

Why, I do believe we’ve been under this tree the whole time! Everything’s just as it was!’

‘Of course it is,’ said the Queen, ‘what would you have it?’

'Well, in our country,' said Alice, still panting a little, 'you'd generally get to somewhere else—if you ran very fast for a long time, as we've been doing.'

'A slow sort of country!' said the Queen. 'Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!'

The story continues with the adventures of Alice in the 'Looking Glass' until she ultimately achieves to morph into a White Queen and escape from there. This book is known with its sense of humor, funny poetries as well as the references to the chess game. The Red Queen itself is also a chess piece (as we said before) and its property is to running very fast. This is indeed an analogy and refers to queen's ability in chess to move in any squares vertically, horizontally and diagonally.

There might be more imaginaries and analogies than those of which have been mentioned here. However, there are some most crucial ones in sense of this realm. First, Red Queen: It is a very fast figure. If Alice runs with her, she has to run, at least, as fast as she does. As it is translated to business language, Red Queen is the focal competitor, commonly the innovator, and Alice is the follower, which has to have same performance level as competing with such a (focal) firm. Second, being hand in hand reflects the statement that there are interactions within competition. None of competitors is independent of its environment. Since First Industrial Revolution, almost for two and a half centuries, the competition changes faster and faster. The perpetual character of innovation changes the competition and thereby the process of competition can be resulted with the deselection of the weak competitors. This is, competition, itself, evolves like competitors too. The other noteworthy analogy is the country. The country may refer to the competition itself. Alice could not get anywhere else, even though she ran very fast. What she did, was only to stay in the same place. Thus, we know that 'Looking Glass' is a very fast sort of country. In business world, what a company does (such as investing constantly to R&D) is often only to stay within competition, to keep its position and to survive (as in the Looking Glass).

This story impressed many academicians from different disciplines in the second half of last century. Van Valen, an American biologist, is the first academician, who used this phenomenon in the academic world (1973) as investigating the challenge of taxa of species in adapting to a new environment. It is advantageous for species to run faster in a new

environment and this helps improve the likelihood of surviving. Van Valen's noteworthy argument in this paper is that evolution does not have a progressive quality (c.f. Robson 2005). Since the environment also evolves, the net effect of evolution of a taxon of species will decrease because of the concurrent race among other taxa. Similarly, in business, almost all big corporations have R&D departments and they devote their energy to the technological progress. Even these corporations achieve to enhance their technologic capacity, it may not be sufficient in order to generate a competitive advantage. This is because other corporations also invest in technology and this lower the net outcome that reflects the difference between current performances of the focal firm and other competitors.

2.2. The Evolutionary Mechanism in Economics

Evolutionary economics assigns an approach based on using some analogies and even methods used in biology. The transformation in economic systems may have some similarities with Darwinian evolutionary process and this is the main inspiration for this approach. The economic and social entities change over time as a consequence of interactions among themselves. Accordingly, there is a selection process and this process is likely to be ended with the change in the characteristics of selective units as well as the population. The selection process, if considered upon change in population can roughly be expressed as (Andersen 2003):

$$(P; E) \xrightarrow{T} (P'; E).$$

where P refers to the population of a group prior to the selection as P' refers to the population at the end of the evolution process as well as E refers to environment. Given that environment remains unchanged, the population changes through such a selection process. In the end of selection process, some of units in the preselection process will be deselected since they cannot adapt to the new characteristics of the population. Selection assigns the fitness to the members of the population prior to the selection process. If there is a change in this manner, the population is likely to show a change in the structure (Andersen 2003). The distinctive property of this process is that fitness is not determined endogenously here, but instead is a consequence of the competitive interaction among firms. How fit a unit of this population is determined through the selective characteristics of the unit, the selective characteristics of all other units as well as the attributes of the selection environment (Metcalf 2004). The fitness values related to each characteristic of selection are likely to be changed and this, in fact,

reflects a structural change. T, on the other hand, refers to innovation and innovation is usually the sole mechanism of such a transformation. In this formulation, innovation, as the main dynamic of evolution, determines the change in the characteristics of population in the end of the evolutionary process. This change often has destructive impacts on the market and is the main resource of radical changes within competition.

Innovation and selection are two figures of the evolutionary mechanism in economics. In the Figure 1., two and three stages models of evolutionary process are demonstrated. Innovation gives rise to the change in the characteristics of entities and this causes a variation. This variation then is combined with selection, which evaluates the characteristics to create a fitness score (Foster and Metcalfe 2003). The units, whose score is over average, are likely to have increasing relative importance than those that have a score less than average. The characteristics of the selection are exogenously determined, whereas the characteristics of selective units are the consequence of the interactions among these units. Two-stage model comes about in such a manner. However, after a period of time, the variation comes to the limits and needs to regenerate. Two-stage scheme turns to a three-scheme model as including development. The development reflects a structural change and includes a qualitative transformation in the system.

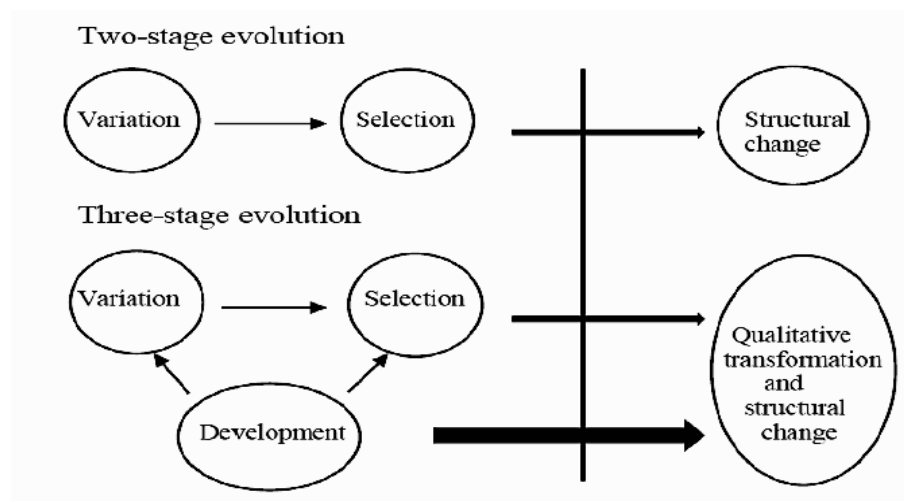


Figure 1. The Evolutionary Mechanism (Foster and Metcalfe 2003)

RQE, appropriate to the general identification of evolutionary process, corresponds to a selection process. Differently from general evolutionary economics, it has an explicit

emphasis to dyadic interactions. RQE is a continual and dynamic co-evolutionary process, where the competitors reciprocally trigger the adaptation and competitiveness of each other. If one of the competitors gained a competitive advantage, the others are likely to react. This reaction can fundamentally be carried out by making a new innovation or by adapting to the new environment. Basically, a company can either find a solution to the problems arose from competition or would be deselected and the competition comes to end.

In the case of deselection, the RQE does not occur. On the contrary, if the company finds a solution, it would get up the company to a higher satisfactory performance level and ‘the solution of the company will be the new problem of the rival’ (Barnett 2008). Coming to new satisfactory level would motivate the other competitors for finding new competitive edges. Ultimately, ensuing from a new response, the competitive advantage will be lost again, and the process continually repeats itself in this fashion. As a result of this process, each of competitors becomes stronger and the process concludes with the RQE. Hence, the RQE can be defined as a process, in which the competitors reciprocally foster the evolutionary progress and push each other to come to higher performance levels within competition.

As it is expressed above, innovation is the main dynamic of such a transformation. In the following section, this mechanism is elaborately explained.

2.2.1. Innovation as the Main Dynamic of Evolution

As it has been expressed above, innovation is the main dynamic of perpetual transformation in economics. The innovation is not a divine intervention and there are some conditions spurring competitors to carry out new innovations. If a competitor encounters the competition, there are principally two alternatives: either she would adapt the competitive environment, or she would respond in a creative manner (Schumpeter 1947). What tempts the competitor to create innovation is that innovation promises higher rents. In this manner, Baumol identifies two ways of accumulating riches for individuals: to obtain a larger slice of the pie or somehow to arrange for the pie itself to become larger, in the process ensuring to receive a significant portion of the expanded pie’ while he refers them as redistributive wealth-seeking and productive wealth-seeking, respectively (Baumol 2010: 140-141). The dominant figure in the history until Industrial Revolution is the redistributive wealth seeking, however with Industrial Revolution, the center of economic activities shifts to innovative activities (productive wealth seeking), which usually conclude with development (extending

the pie) as a variation of positive outcomes. This type of wealth seeking refrains competition from being a zero-sum game and leads a creation of new processes, new accesses to resources as well as a change in systems entirely.

Innovation cannot be explained only as a technologic or scientific progress. It is not only invention, instead, innovation can be defined as ‘not thinking of do something new, but to find a combination of existing things’ (Salter and Alexey 2013: 29). There are number of inventions in the human history such as gunpowder, compass, printing and so on, however none of those has an explicit influence on the economic transformation and growth. The underlying reason here relates to whether these innovations are considered pertaining to wealth seeking. It was not tended to use those inventions with the pursuit of improving productivity in the early ages. Thus, in the sense of evolutionary theory, they failed to create variation. However, after Industrial Revolution gave birth to a new competitive system, number of entrepreneurs entered to the various sectors as they triggered the productive mechanisms and also foster the productivity of the society. Two main dynamics are indeed the sources of the growth in the contemporary economics: the first one is the competitive economic system, which allows different entrepreneurs to enter the market and the second one is the innovative competition between large corporations (Baumol 2002). Innovative competition goes on as an arms’ race, since large corporations make investments to new technologies to catch up with other rivals. This is in fact one of the main motives of the contemporary business, which Baumol contends as a red queen game. Big corporations commonly incorporate R&D departments, make perpetual investments, even these investments are not intending to bring competitive advantage, but instead only intending to stand still.

The main resource of innovation is indeed the uncertainty about the future in a market. These uncertainty, as a conclusion of lack of information, presents some ambiguity and therefore opportunities. Entrepreneur, who is commonly creator of innovations, seizes such opportunities and therefore, generate competitive advantage (Kirzner 1997). This triggers the variety process. Entrepreneur’s role here is ‘the doing of new things or the doing of things that are already being done in a new way (innovation)’ (Schumpeter 1947: 151). Innovation constitutes as a destructive process according to this approach, which is likely to be concluded with spectacular, unpredictable and radical changes in the competition. Entrepreneur in the Schumpeterian approach is responsible for destructive changes. However, in contemporary economic system, innovation may not be in such a fashion. Innovations can basically be

classified as radical and incremental innovations. Radical innovation, as Schumpeter argues, has destructive conclusions as the latter refers to a routinized type of innovation carried out by large corporations. The outcomes of such innovations are not radical, and it is likely an accumulation of mutual efforts, which includes various interrelationships between companies such as cooperation. On the other hand, radical innovations are usually carried out by independent, small entrepreneurs since such costly and risky investments are not feasible for large corporations (Baumol 2010).

Prior to the next section upon the relationship between innovation and competition, I want to conclude with some major characteristics of innovation that summarized by Mytelka and Smith (2001: 8-9):

- Innovation is not something that happens in a relatively small group of high-technology industries, or something that is driven by a small set of industries or technologies; it is instead distributed across the entire system.
- Firms invest in a wide range of innovation inputs, including training, prototyping, acquisition of capital goods, design development, market research and so on.
- Firms very rarely innovate without technological cooperation or collaboration.
- Innovation involves serious uncertainty both in technological and in economic terms.
- Clustering appears central to competitive advantage, a result that has emerged from a wide variety of studies.
- There are broader factors shaping the behavior of firms apart from the collaboration: the social and cultural context, the institutional and organizational framework, regulatory systems, infrastructures, the process which create and distribute scientific knowledge and so on.
- The science system is important for innovation, and there is a strong interaction between technology and science.

2.2.2. Innovation and Competition

Innovation is the engine of variety created in the competition. As Foster and Metcalfe (2003) express, the process of evolution goes on in such a fashion: (Economic variety + market coordination) = Differential growth + Structural change + differential accumulation of knowledge + renewed economic variety. In the course of such a transformation, innovation initiates the process by qualitatively changing the characteristics such as design, aesthetic,

organizational, productive and so on. However, to be meaningful or in other words, to convert variation to a competitive advantage, variation should be valued by the market mechanism. This is, innovation should be commercialized. The success of innovation depends on the exogenously determined selective units and these are unlikely to be predicted accurately. As an instance, even it appears very attractive or useful, a product may not be in a request since it fails to address the customers' needs. Similarly, even the product is suitable for the needs of customers, it may fail, because of the shortcomings in the supply chain. In such cases, the economic conclusions may not be to the favor of innovator and the process may fail in the very early stages. On the other hand, if the innovative activity achieves to create variety, the process will be in another direction.

If the innovators achieve to create competitive advantage, this attracts other competitors, too. In this situation, the market (or industry) is likely to be swarmed by new entrants. According to Utterback and Suarez (1993), the dominant design, which enforces the standardization of the market, is an early stage of the dissemination process. A new dominant design ensues from a destructive innovation. Authors argue that this dominant design is pursued by new entrants and the number of firms reaches a peak in a short time. In the early periods, a temporary monopoly situation, high unit profit margins and prices as well as increase in sales may appear. With new entrants, the effective competition is again fostered in different dimensions such as costs, scale, product performance and so on. In this course of effective competition, particularly large firms may create incremental innovations, but a radical innovation, which may properly conclude with a change in the dominant design only comes about in the end of this process. The effective competition concludes with exits of weak rivals and after a time, the market reaches a point of stability and finally, variation begins to vanish again. In this final stage, the market is shared by a constant number of participants; technological progress may slow down and large firms, which occupy the niches, effort more to create barriers against new entrants. The equipment costs may be raised, or the large firms try to enhance their control over supply chain with the intent of creating barriers against new entries (Utterback and Suarez 1993). However, according to authors this situation initiates a new cycle if a major technological discontinuity appears in the market.

In the course of innovation, some novelties may harshly affect the rivals while impact of some is only incremental. Radical innovations may obsolete the former technology or the product. In such a case, the sales as well as the profit margins of former product may detrimentally decrease, and the process will be disruptive, if those competitors cannot achieve

to adapt to new environment. There are number of firms that lost their dominating position in the market. The firms, which create a disruptive effect, usually open up new markets and may change the rules, entirely. Bower and Christensen (1996) argue that these firms act in an unpredictable direction and address a customer group, which is neglected or not realized by the former dominant firms. If there is a customer group, which may have different expectations and if the new technology is valued by those customers, the disruptive effect can come about. This disruptive effect is suitable to the transformation process. However, firms are hardly isolated from competition and there is a perpetual information flow between competitors. Moreover, the knowledge accumulation entails the contribution of several parties such as universities, governments etc. and this knowledge is indeed collected in knowing pools (Fagerberg et al 2003). Firms have many intra and inter-organizational complexities and the differential growth as well as structural change formulated above is a consequence of such a flow of information. Such a dynamic mechanism provides the exchange of knowledge, better understanding of market mechanism as well as a sectoral growth. This interactive process corresponds to accumulated knowledge and this consequently fosters new innovations, which are commonly astonishing and spectacular.

The influence of innovation on the market and competition explained above corresponds to a radical change. Beside the destructive Schumpeterian approach, firms may not target to create such radical innovations and the process of innovation in contemporary business is decision-making based. The managers practically should take into account the short run expectations and strategic priorities. This does not prevent variation and there may also be contributions to accumulated knowledge in long run. However, some types of innovation may aim to change some characteristics rather than make the product or technology completely obsolete. The manager should make decision between short and long run objectives subject to the idiosyncratic resources, knowledge and capacity. In this respect, Abernathy and Clark (1985) define four different types of innovation in terms of different postures of competition: Architectural innovation; innovation in the market niche phase; regular and revolutionary innovations. Architectural innovation is such a kind of innovation that creates or establishes new industries. Innovations for niche phase are those that create new opportunities from existing technologies and address a niche. Regular innovation is indeed as same as incremental innovation and entrenches existing skills and resources and has a cumulative effect. Revolutionary innovations are radical innovations. According to this quadrant, authors define a 'transillience map', capacity of an innovation to influence the firm's existing

resources, skills and knowledge' (Abernathy and Clark 1985:3). To conclude, authors argue that: "while a firm may have a dominant orientation, it is likely that the firm will face the task of managing different kinds of innovation at the same time" (Abernathy and Clark 1985:21). Consequently, the managers should make decision in terms of different situations and define versatility between those types of innovation.

2.2.3. Innovation and Co-evolution

Thus far, the main contribution of innovation to economy as well as the influence of innovation on competition is explained. Accumulation of reaches by a productive wealth seeking is the main contribution of innovation. The trajectory of evolutionary mechanism reveals, how a competitive advantage can be generated, how this attracts the other competitors and consequently how the other competitors can reach the aspired performance level, as explained within red queen phenomena. Even the main emphasis of the RQE is on the reciprocal relationships between firms, the co-evolution may come about in the larger extents and the RQE may conclude with a transformation in the entire system.

In the manner of red queen, Van Valen's contribution upon species taxa adapting to the new environment is also insightful to explain the coevolution in business. The underlying condition here is that other taxa have relationships among each other and the coevolution process does not consist of interactions among certain groups. The competition with each of these group may diverse the performance of the firm. Thus, the coevolution is not only one dimensional, but instead is an issue about the system. Geels (2005) argues that coevolution comes about in three different levels (micro, meso, macro) and in each of these levels is formed by different engines (technological niches, sociotechnical regimes and sociotechnical landscapes respectively). The author sums up these under the notion of nested hierarchy. In the micro level, the learning process of the firm is carried out in different departments and since this process is more isolated from the environment, the radical innovations are carried out in this level. The creation of innovation entails the involvement of many departments of the firm. In the meso level, an autonomous engineering activity appears in universities or other foundations, which targets to amplify skills. This level entails the involvement of different subgroups such as engineers from different disciplines. In the macro level, the exogenous environmental influences (political, environmental etc.) appear, which spurs the innovation to become mainstream. These three levels are embedded within each other and the innovation is diffused in terms of this hierarchy (Geels 2005: 685). As a consequence of

nested hierarchy, a system innovation comes about, the innovation created in the micro level tested in the meso level as well as tested and developed here and the innovation turns to a dominant design. In the last stage, a breakthrough occurs, supportive systems are involved in the process and consequently the diffusion of innovation occurs.

Such a transformation envisages a process relying on the interactions among organizations. Innovation does not stem from entirely endogenous sources, but instead is a fruit of information flow among firms. This information flow may ensue from co-operations, alliances or may be a consequence of meso level value creation (for instance in universities). Nelson contends that there are subroutines in complex systems and they are linked with each other (Nelson 2003). According to him these routines are widely used because of two main reasons: first, such routines are a result of cumulative contributions of many parties and second, particular routines are tending to be a part of systems of routines. If idiosyncratic routines are created, these should be supported by own supportive systems. Thus, knowledge share is very common particularly in high technology industries.

2.3. The RQE and Organizational Characteristics

Thus far, RQE is explained within evolutionary economics perspective, in which the selection and evolution are main figures. Both Schumpeterian and other evolutionary economics scholars' argument is upon that evolution comes about within a selection process that fostered by destructive changes (innovation). These approaches mainly suppose that competition is a characteristic of the market that consists of various competitors. Differently from them, Barnett and Hansen (1996) argue that the RQE can be handled within organizational learning and organizational ecology perspectives. Properly, they argue that competition may vary among organizations and is indeed not a characteristic of the market. This means that each of competitors may have different levels of viability and competitiveness and the main sources of the potency in the competition are endogenous characteristics that stem from the capacity and resources of the organization. Such characteristics determine the ability of adaptation as well as the viability of the organization. In figure 2, red queen among two organizations is demonstrated.

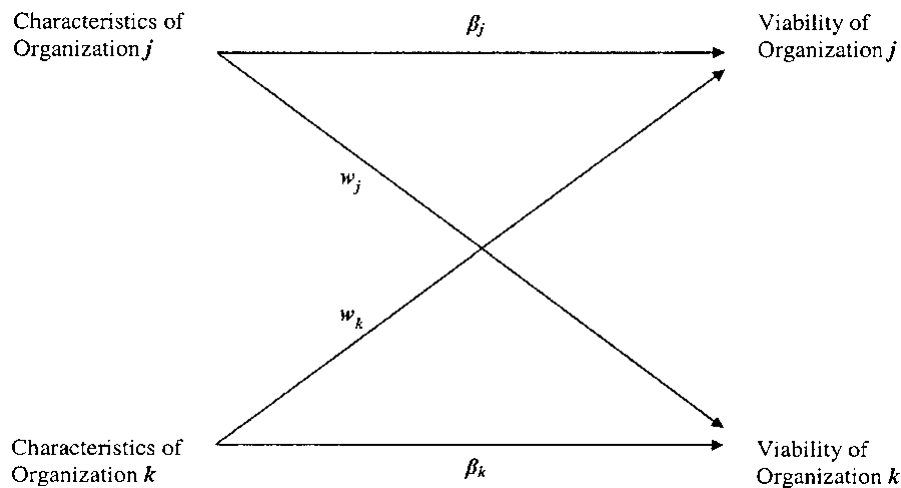


Figure 2. Red Queen Among Two Organizations (Barnett 2008)

In Figure 2., each of these firms has different resources and capabilities that assert the competitiveness as well as the viability of them against each other. The competitiveness of firm j may harm the viability of the firm k or vice versa. Even if one of the competitors is more competitive, it may also be more vulnerable against the competitiveness of the other.

Organizational learning perspective is based on the premise that firms are routine based, history-dependent and target-oriented organizations, which change through a learning process (Levitt and March 1988). The first reaction of a company, which is exposed to competition, is learning (Barnett and Hansen 1996). Supposing that the members of an organization first aware the competition, when they are affected in daily activities, their reaction will be to find some local and sequential solutions, which lead them to come to first satisfactory level, rather than to look for all alternatives and choose the most optimal one. This is consistent with the bounded rationality argument. Bounded rationality argument is articulated by Nelson and Winter (1982) and contends that managers are also human-beings. They may not take all changes into consideration and thus, may make wrong decision. From this reason, they tend to adopt routines as they make decisions. Thus, to what extent organization is able to learn depends on routines, which are learned and codified within the organization and also constrained by inertias, which stems from competitive experiences. An organization is socially constrained since it has unavoidably interactions with other competitors. These interactions, which are concluded through learning and adopting new routines, may be observed over dyadic learning histories. According to Barnett and Hansen (1996), learning may conclude with negative outcomes, too. Some experiences can be maladaptive. Properly, if the organization has recent competitive experiences, they would make the organization

more viable and distant experiences turn to inertias, which mislead the firm (Barnett and Hansen 1996). Consequently, learning concludes with competence trap and hinders the firm to adopt superior routines (Levitt and March 1988).

Barnett and Pontikes (2008) distinguish the influence of experience as weak-form constraints and strong-form constraints. Weak form constraints are those that cause co-evolutionary development diminishing with the passage of time. One form of weak constraints is organizational memory. Organizational memory will be less accurate within time. The recent experiences have more influence on the viability of the organizations than the past experiences. Another weak form constraint is the diminishing returns. Since the organizations are likely to create barriers to new entries, joining the market for new firms will be costlier and in turn, profits will diminish. On the other hand, strong-form constraints are those lessons that learned in the past and become maladaptive. Adjustment of aspiration is one of these strong constraints. This is, organizations may fail to perform on aspired levels. Organization apprehend it gradually and organization consents to come to a level that all tasks can be carried out by each of organizations. Thus, equilibrium is created on an inferior level. In this case, red queen and evolution come to end. New downward aspirations seem to be strong-form constraints, because if all competitors are on the same level, the competitive relations go on to be strong and, in this case, a new search process may begin. Another strong-form constraint is the competency trap. Similarly, if the competency trap occurs in the entire cohort, this is if the coevolution is misled and gets far away from satisfying the environment's expectation, the competency trap will occur within all organizations, competitors stay therefore in the same competition level and the process will be maladaptive.

The red queen process can be understood twofold. First, red queen process can be perceived as an arms race coming about under R&D activities through large investments. Second, red queen may be perceived as a consequence of daily and fine-grained changes. The former entails larger capacity and more resources as the latter usually includes small reactions. The difference between the extensions of the activity depends on what type of knowledge the firm needs to adopt. The taxonomy of Lundvall and Johnson (1994) may be insightful to explain this fundamental point. According to their taxonomy, there are four types of knowledge: know-what, know-who, know-how and know-why. Know-what aims the facts and it is akin to information. Know-why is interested in the reasons hidden beneath and aims understanding the principles. Know-how refers to the practical issues and interested in how the routines are implied. Know-who is about who knows what and to do what. This taxonomy is important,

because the difficulty to access knowledge is related to which type of knowledge is required. If the firm requires to know what, this can be obtained through restless information flows. On the other hand, if the know-why is the main issue, if the firm needs a deeper understanding, the challenge may be fiercer. To access know-who may be carried out by employing skillful workers and so on. The red queen process is assigned by such a need to knowledge. Such challenges may enforce competitors to create mechanisms to exchange the knowledge or build new networks to access knowledge (Lundvall 1996). These mechanisms play crucial role in the red queen process, since they accelerate the learning process.

Another issue regarding to the learning is the variety of cohorts. An organization may confront with several cohorts at the same time. In such a case, the organization confronts with competitors that have different routines. Different cohorts expose the organization to survive in different contexts and this makes the competition more complicated (Barnett and Hansen 1996). Conceivably, if the market concentration is higher, the number of dyadic relationships and the likelihood of confronting with different cohorts would be higher. Thus, the organization will be constrained through a fiercer competition since there will be more interdependencies than a market with lower concentration (Derfus et al 2008).

Even if the competitive experiences may turn to inertias and hinder the firm to adopt novelties in a short time, it does not stop the dissemination of innovation. If a competitive advantage is once generated, the firms are tending to protect this advantage from competition. Thus, learning may not stem merely from the competitive experience, but also from the impulse of the focal firm (innovator). Properly, Kogut and Zander (1993) pay attention to a paradox: they argue that if a firm adopts new routines and generates a competitive advantage, it efforts to hinder these routines from being imitated. On the other hand, the routine should be adopted by employees and be diffused intrafirm. This can be carried out through codification. If once the routine is codified, then the likelihood of being deciphered increase. Thus, the firm decides either to codify the routines with intent of diffusing them intrafirm or protect the routines from being duplicated. This is a paradox. Such a situation may affect the longevity of the competitive advantage as well as the growth, in a broader manner. Authors suggest that a firm may refrain from such a problem through the combinative capability, a combination of the existing capability and acquired knowledge (Kogut and Zander 1993). In this case, imitation may be more difficult since path-dependency makes the process more complex.

As it has already been emphasized, some competitors are selected out at the end of the red queen process. In the post-selection process, only strong competitors remain in the market and a contextualization comes about. All firms tend to adopt similar routines in this stage. Through this means, selected firms achieve exploitation in the market. However, if they opt to explore in another market alternatively, they may fail, because they would encounter more cohorts in new markets. Thus, explorative effects may be disruptive for the firm itself in a new market, even firm has strong exploitative effects (Barnett and Pontikes 2008). The routines of firm may not be appropriate for exploring in a new environment. This is important, because there is a contradiction here; authors also argue that the companies that opt to explore in new markets are generally those that have successful competitive histories. Those successful experiences may mislead the firm. In order to develop, firms may then incorporate autonomous departments that merely search for exploration. Ambidextrous organizations are those, which incorporate an autonomous department that is only responsible from exploration (development). The major activity of these departments is to search for the routines which are entailed to seize future opportunities. Such an organizational structure enables firm to consider on future, at least partially, independent of inertias (O'Reilly and Thusman 2004). This also may help the firm to change the context and it enhances the capacity to struggle against different cohorts.

McKendrick and Barnett discuss over, how the size of the firm may influence the RQE (McKendrick and Barnett 2004). Small and large organizations may respond differently to the competitive pressure. Prior to this distinction, authors distinguish two different logics of competition: competition as a contest or as a constraint. As a contest, competition is driven as arms race, which is carried out by large firms and in such a competition, one competitor triggers others competitiveness. In the case of being perceived as a contest, RQE may vary in terms of firm's matching and exceeding the rivals' actions (Derfus et al 2008). As a constraint, competition is likely to harm the competitor's ability of adaptation. In such cases, the issue is whether the organization is exposed to competition or is being isolated. Large firms have more capacity and resources to react to the competition and are therefore more isolated and less susceptible to the RQE. On the contrary, small firms are more struggling and less likely to fail in the long run. Large firms have different and more complex routines, which enhance the potency. However, their ability to struggle with constraint is better than small firms, as small firms may yield more benefits from the red queen competition. Large firms have more positive experience and implied successful routines in the past. However,

Derfus et al (2008) predict that the negative impact of firms on the market leaders is greater than those on non-market leaders.

Finally, a crucial question is why competitors persist to stay in the red queen competition, even though the outcomes remain under the desired level. Lampel and Shamsie (2005) argue that, competitors adopt rules of the competition collectively and there is a common performance criterion, which allows them to determine how the resources can be allocated optimally. However, authors argue that on the other side, this leads firms to adopt more simple routines and this constrains firms from searching for innovative routines. How a company may escape from the red queen competition is also a question worth to deal with. Voelpel et al (2005) suggest a broader view of business landscape with pursuit of transforming the customer's value proposition. According to their trajectory, the business model can be reinvented in terms of a sense-testing model consisting of customer sensing, technology sensing, business infrastructure sensing and profitability sensing. They argue that a firm can be more sensitive to expectations of its environment. Therefore, the firm can improve the likelihood of creating disruptive technologies.

2.2.3. Sustainable Competitive Advantage

Alongside its references to evolution, red queen process also emphasizes that profit margins diminish over time and the variation vanishes, as well. The routines are learned, technology is diffused and therefore the competitive advantage is likely to be lost, ultimately. However, to what extent competitive advantage can be maintained may vary in terms of several factors. Resource based view approach presents the sustained (or sustainable) competitive advantage (SCA) concept as a function of internal capabilities and resources. According to this view, the sources of a SCA are the resources and capabilities, which are valuable, rare, imperfectly imitable as well as non-substitutable or at least difficult to substitute (Barney 1991). Through the heterogeneity owing to those resources and capabilities complexities and causal ambiguities can be created and firm would have a SCA.

The heterogeneity mentioned above stems from the idiosyncratic physical, human and intangible resources and capabilities (Mahoney and Pandian 1992: 370). The heterogeneity lasts as long as the firm achieves to protect those resources from being obtained or duplicated by other rivals. This protection can be carried out through property rights, barriers to entry or through creating different complexities.

Resources refer not only the capital, but there is a broader meaning here. A resource can be tacit knowledge, human resources, demographic advantages and so on. According to Coyne (1986) SCA may be result of capability differentials, which will endure (Coyne 1986). He also classifies the capability differentials as based on assets (regulatory capability and positional capability) and on competencies (functional and cultural). Grant (1991) argues that the resources and capabilities have to possess four characteristics: being durable, nontransparent, not transferable and nonreplicable. If those characteristics are satisfied and they are also appropriate to capabilities of the firm, a SCA can be generated.

Another important issue is the causal ambiguity in terms of the concept. Causal ambiguity refers to the understanding of the rivals about resources and capabilities generating SCA. Three main characteristics of causal ambiguity are identified: complexity, specificity and tacitness (Reed and Defillippi 1991). Complexity is often aligned with the organizational structure of the firm and how the resources are matched with the capabilities. Specificity refers to specialization on the production. Specificity leads the firm to improve its knowledge and experiences and therefore to have an advantage of specialization. Tacitness, on the other hand, is more human dependent factor and associated directly with the knowledge. People may not be able to codify all of their skills and they have innate abilities, which are almost impossible to be imitated. In such cases, the way of possessing this resource is to employ such talented people. If it is not possible, rivals can try to understand the tacit knowledge through working with experts, coaches, recording learning stories as well explicit learning (training young managers by those skillful people) (Lubit 2001). Consequently, if the causal ambiguity is higher, the competitive advantage would be more sustainable.

The concepts of the RQE and SCA are sought to be antonym. If once a SCA is achieved, then no RQE occurs and vice versa. Thus, as questing to what extent the competitive advantage is sustainable it is also examined, whether or not there is a RQE. As different from the industrial organizational (IO) perspective (Porter 1980), where the competitive advantage is mainly emphasized as a yield of industrial positioning among various actors (customers, suppliers etc.), this approach concentrates on the idiosyncrasies among competitors. Thus, there is a similarity with the red queen in organizational learning theory. However, the social constraints seem to be neglected entirely in this process. Instead, the complexities, as in codifying the knowledge is decisive on whether the resources and capabilities are easy to duplicate, as Barney (1991) pointed out. According to Hall, companies have sustainable competitive advantage as long as they consistently produce products and/or delivery systems

with attributes, which correspond to the key buying criteria for the majority of the customers in their targeted markets (Hall 1993:610). This on the other hand reflects a relationship between the firm and the environment. To conclude this section, a recent objection of McGrath is noteworthy. McGrath (2003) argues that competitive advantages are lost temporarily, and competitive advantage is only transient in the age of perpetual transformations.

One of the noteworthy approaches pertaining to RBV is that firms can create relational competitive advantage through cooperation, allies and networks. This appears as an amalgam of Industrial Organization (IO) perspective and RBV, which indeed address more recent conjecture of the business. Dyer and Singh (1998) contend that firms can go toward an inter-organizational rent-generating process. Contemporary business is tending to cooperate, and competition is likely to be among networks instead of conventional single competition. If this is the case, firms would consider on creating new relationships and can generate more rents through relation-specific assets, knowledge sharing routines, complementary resources endowments and effective governance of capabilities (Dyer and Singh 1998). In this approach, the unit of analysis is pair or network instead of single firm in RBV and entire industry in Industrial Organization perspective. Furthermore, source of profit is not only tacit knowledge (RBV) or collusion (IO), but instead inter-firm knowledge sharing. Similarly, the heterogeneity of resources and capabilities of a firm can be influenced by the social norms and such norms would make the resources more sharable or transferrable. Beside the economic rationality, firms are bounded with institutional normative rationality and the social justification of the firms' decision is not ignorable. Thus, the managers have a task not only to provide the optimum allocation of resources but also to manage the social constraints to pursuit of having a SCA (Oliver 1997).

2.4. Formulation of Questions

Principally three questions as appropriate to the theoretical perspectives presented here, are asked.

1. Does CSR have an innovative impact?

Through this question, it is also aimed to trace whether it is possible to create variation through CSR. Since, as it is explained in the bottom of this section, evolutionary mechanism is started with innovation and thoroughly, a selection comes about. The innovation is the

mechanism, on the other hand, that gives initiation to competitive advantage (through market mechanism). Another issue under this question is to what extent CSR can influence the transformation of process or changes in the characteristics of products. This is of importance regarding to fitness of the company. If the company is fit, then it should adopt to new changes. On the other hand, it is also important from RQE perspective whether the innovative change is radical or incremental. Third point under this question is whether there are any system innovations coming about as a result of CSR policies. This may reflect the coevolution through innovation stemming from CSR strategies.

2. Does CSR bring a sustainable competitive advantage (SCA)?

This question has of importance, because notions of RQE and SCA appear as antonym to each other. If CSR generates a SCA, it means that the responds to initial action are not strong sufficient. Beyond that, since SCA reflects another theoretical perspective, it presents an alternative inquiry. Under this question, it is aimed to ask also, whether CSR corresponds to a valuable, rare and inimitable strategy. Conceivably, it may also be asked whether CSR policies can generate such an advantage, if valuable, rare and inimitable resources and capabilities are manipulated by firm into such a direction. Another objective of this question is to trace, whether there are any substitutes for CSR under the circumstances of competition.

3. Is CSR easy to respond?

Through this question, it is aimed to examine the influence of CSR in terms of organizational learning and organizational ecology perspectives. In this perspective, it is argued that the recent competitive experiences among similar organizations as well as different cohorts can assert the RQE. Beyond that, some organizational characteristics may play role in the red queen process (for instance market concentration, firm's size etc.). Finally, it is also reasonable to trace whether the initial action in the competition triggers reciprocal arms' races and motivates other to invest more. On that account, it is also aimed to examine whether the first movers can maintain their advantage of being first mover or the technology is disseminated, and such an advantage is blurred within time.

3. CORPORATE SOCIAL RESPONSIBILITY

As it has already been stressed, the main motivation of this master's thesis is to scrutinize the influences of CSR on competition. The RQE approach presents here a theoretical background embracing co-evolutionary economics, organizational learning and resource-based view. What differs the RQE from many other theories is its strong references to the action-reaction dyad among competitors. Accordingly, if one focal firm creates variation through its innovative actions, the others are likely to respond. Thus, the questions asked in terms of the RQE aims to examine those interactions among firms exposed to competition through CSR.

CSR is a very popular matter of debate in business over a half century and despite that there is still no consensus upon many issues pertaining to CSR. For instance, even though the subject of CSR has been studied almost over half of a century, the arguments over definition of CSR are still equivocal. However, in practice, the majority of corporations have already incorporated CSR departments, despite the costs arose from CSR.

Prior to the analysis of CSR from RQE perspective, it seems essential to introduce CSR in terms of its historical background and present its various definitions that evolved over time. Even though CSR has been remaining in the agenda of both academia and business for a long time, the history, the boundaries as well as the definition of the CSR have altered. Thus, it would be reasonable to start the chapter with introducing CSR by history and definition.

3.1. The History of CSR

The vast majority of the literature over CSR belongs to post-war (World War II) era. Except some companies like Johnson & Johnson and Ford, which early realized that doing something for the society may have influences on the sales and profits or some academicians like Heald, who articulated the "trusteeship concept" (Center for Business Ethical Cultures 2010), the responsibility of business to the society was blurred before World War II. The roots of the philosophical context of CSR can be found in the articles of Donald K. David (1949), the dean of Harvard Business School, and Donald Dempsey (1949) (c.f. Center of Business Ethical Culture 2010). In these articles, it is argued that business should contribute to the wellbeing of society for two main reasons: (1) business needs a well-functioning community and (2) business has a capacity to contribute to the progress of the society. Dean David describes the role of contemporary managers by 1949 not only as maximizing profits but furthermore as creating a good society pertaining to country's target of attaining world leadership. This view

should be handled regarding to the political sphere in those years. The motivation is indeed to use social responsibility concept (which had not been articulated as CSR, yet) as a tool against the danger of socialist wave coming from Soviets (Spector 2008).

CSR has its roots from such a viewpoint. The discussions over the realm are still among the most popular matters of debate for business. The history of CSR also reveals, how the concept has evolved over years. Within almost passed sixty years, number of definitions has been derived, the dimensions of CSR have been stretched and also number of new concepts relating to CSR has proliferated. The history of CSR handled by many prominent scholars embraces four stages from 1950s until today (Carroll 1999, Frederick 2006, Lee 2008). The main arguments, drivers, actions as well as principles for CSR in those stages can be seen in Table 1 (Frederick 2006).

Historical Evolution of CSR

CSR₁ : CORPORATE SOCIAL STEWARDSHIP (1950s - 1960s)

Guiding CSR Principle: Corporate managers are public trustees and social stewards.

Main CSR Action: Corporate Philanthropy

CSR Drivers: Executive conscience and company reputation

CSR policy instruments: Philanthropy and Public Relations

CSR₂ : CORPORATE SOCIAL RESPONSIVENESS (1960s - 1970s)

Guiding CSR Principle: Corporations should respond to legitimate social demands

Main CSR Action: Interact with stakeholders and comply with public policies

CSR Drivers: Stakeholder pressures and government regulations

CSR policy instruments: Stakeholder negotiations and regulatory compliance

CSR₃ : CORPORATE/BUSINESS ETHICS (1980s - 1990s)

Guiding CSR Principle: Create and maintain an ethical corporate culture

Main CSR Action: Treat all stakeholders with respect and dignity

CSR Drivers: Human rights and religio-ethnic values

CSR policy instruments: Mission statements, ethics codes, social contracts

CSR₄ : CORPORATE GLOBAL CITIZENSHIP (1990s - 2000s)

Guiding CSR Principle: Accept responsibility for corporate global impacts

Main CSR Action: Adopt and implement global sustainability programs

CSR Drivers: Globalization disruptions of economy and environment

CSR policy instruments: International code compliance, sustainability policy

Table 1. Four stages of CSR (Frederick 2006)

1950s – 1960s: In this stage, the initial definition of CSR was done by Bowen (1953: 6) (c.f. Carroll 1999): “It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society”. Beyond that, Bowen initiated to conceptualize CSR and gave birth to discussion over CSR as a normative case. Accordingly, CSR as a normative case has also three basic core principles stand out in this stage: corporate managers as public trustees and stewards of broad-scale economic interests; an executive duty to balance the competing claims of employees, customers, owners and the public; and philanthropic support of worthy social causes (c.f. Frederick 2006). As it can be seen from Table 1, the main drivers of this era are reputation and executive conscience, as the philanthropic activities were used as the main tool of CSR.

One of the main triggers of the debates upon the normative aspect of CSR is the political activism in the U.S. during 1960s. As a result of this political activism, number of regulations was enacted to the favor of consumers and employees in 1960s. This caused a conflict between society and managers, which motivated managers to develop public relations- based policies (Lee 2008). Another concern about CSR in those years was that it was seen as a costly operation that harms the financial bottom line. This is aligned with the normative case argument of Bowen. On the other side, Levitt’s objection was that the intervention of the government to business jeopardizes the profit-maximizing objective of business and this may harm the capitalist system entirely (Levitt 1958). According to him, the tasks of business and government are different from each other and the objectives about welfare are not among issues of business. Friedman (1970) was another economist, who argued that CSR would cause an agency problem and cannot be carried out by managers. He called CSR as “philanthropy with money of others”. According to him, business has only one responsibility and this is to maximize profits. Both of these scholars, indeed, had ideological concerns and fundamentally, see CSR as a replication of the socialist system.

1960s-1970s: Despite the ongoing debates over the definition and the concept, the realm was discussed as a positive case. The relationship between social responsibility and social power is articulated (Davis 1960, c.f. Carroll 1999) in this stage. This is indeed beyond the public relations activities of business. Moreover, the enlightened self-interest - better society produces a better environment for business - (Davis 1973) as well as avoiding interference – if we are not good, they will move in- (c.f. Mintzberg 1983) are remarkable mottos of this stage. As it is stressed in Table 1, the main principle here is that business should respond to

legitimate demands of society. Another remarkable point is that CSR is aligned with corporate financial performance (Lee 2008) and this ultimately leads the birth of ‘corporate social performance (CSP)’ approach. Carroll’s definition of CSR is also a remarkable contribution in this stage. His definition is a milestone at the path of CSR. He explained CSR as a concept embracing those four domains: economic, legal, ethical and discretionary/philanthropic (Carroll 1979). Through this concept, he points out that the organizations should have good relationships with stakeholders as on the other side, he pays special attention to moral management. This definition gained more ground since it aligns the social responsibility activities with economic outcomes. Owing to its consistency as well as comprehensiveness, the concept of Carroll has been cited by many academicians and despite the nonuniformity among definitions, it drew a frame for scholars studying on CSR.

1980s and 1990s: In 1980s, some concepts akin to CSR such as Corporate Public Policy, Business Ethics, Stakeholder Management Theory (Carroll and Shabana 2010) were proliferated. Even though there is a vast literature over each of these concepts, they all have a common property, and this is their emphasis to the interrelationships with society. Two main characteristics of this period are (Frederick 2006): first, the relationship between corporate social performance (CSP) and corporate financial performance (CFP) is analyzed. Rather than deriving new definitions or concepts, business and academia either focused on empirical studies. Second, the business ethics was conceptualized and started to be a common issue for entire business. The codifications, rules and standards subject to the ethical concerns turned to be mainstream activities of corporations in those years. On the other hand, the efforts upon progress of Stakeholder Management Theory reflect the landscape in the history of CSR and this concept was intensively handled in 1980s. Later on, in 1990s the concept gained ground as a business case and CSR started to be considered among core activities of firms.

1990s-2000s: Parallel to the maturation in the Strategic Management Theory, the focus on CSR shifted to its strategic role. Many of large corporations incorporated CSR departments in this stage not only for ethical or altruistic reasons but also with pursuit of profit maximization. Similar to the influence of politic and macroeconomic atmosphere in 1950s and 1960s, CSR was influenced by macro-environmental factors in this stage, too. The Cold War came to end in 1990s and large Western corporations turned to multinational entities. In other words, globalization leads corporations to turn their face to the developing countries, inevitably. Thus, the concepts such as Corporate Citizenship became very popular in business world. Corporate Citizenship refers to social responsibilities of the big corporations. While reasons

such as low labor costs, resources and growing customer base in developing countries were perceived as opportunities, the corporations directly encountered problems of society in those countries. Problems such as poverty, illiteracy, plagues, corruption and so on started to be among tasks of those corporations.

The development of CSR's concept and evolution of its definitions was notably influenced by the macroeconomic and political atmosphere at a given point in time. As an instance, in 1950s the main motivation for the business to behave socially responsible was the defense of free market economy against Soviet danger (Spector 2008). In 1960s, some political movements, the political activism in American society and some new regulations had enforced business in this respect. The business world had ultimately responded this social activism by devoting its attention to social responsibility policies. Beyond that, the expanding role of entrepreneurs in the capitalist economy improved the expectations of society from business and business was implicitly exposed to make more contributions to the welfare of the society. On the other hand, some prominent academicians advocated in 1970s and 1980s that CSR might be a resource of differentiation. Furthermore, CSR is seen as a trigger of innovation, and through this means, a tool of strategic positioning (Porter and Van der Linde 1995). In 1990s and 2000s, with the influence of globalization, many corporations started to incorporate CSR departments in their organizations and the center of debates gradually shifted from macro-social effects of CSR (as in 1950s) to organizational levels analysis of CSR's effect on financial performance (Lee 2008:54). Similarly, Frederick articulates this transformation as from ethical-philosophical concept of CSR (CSR1) to the action-oriented managerial concept of social responsiveness (CSR2) (Frederick 1997, 1998 cited in Garriga and Mele 2004). As a consequence of this transformation, strategic CSR that explicitly address the role of CSR to the favor of business, is born.

3.2. Definition of CSR

As it has been mentioned above, number of definitions has been derived pertaining to CSR concept. However, the variety of definitions makes the boundaries of the concept unclear. Furthermore, it makes the academic progress difficult and also harms the reliability of the empirical results (McWilliams et al 2006). Despite the vast literature, there is no consensus about the definition of CSR, yet. The literature shows a tendency of proliferating of different concepts and definitions, which is determined as vibrating and developing of the concept (De Bakker et al 2005).

Dahlsrud aimed to trace which dimensions of CSR have been used more often (Dahlsrud 2008). He first conducted a literature review about the definitions, then identified five dimensions of CSR through a content analysis. Through using an own-produced coding scheme, he determined which definitions reflect which dimensions and finally, through using frequency counts from Google, he calculated the relative usage of each dimension. The dimensions that he identified were the environmental dimension, the social dimension, the economic dimension, the stakeholder dimension and the voluntariness dimension. In his study, the stakeholder dimension got the highest score, as the environmental dimension got the least score. Finally, he concluded that CSR is seen as a phenomenon rather than as social responsibility of business. According to him, it can be the reason of this variety, because the confusion is not about the description of CSR, but instead is about what constitutes CSR.

Carroll's comprehensive study about the definitions of CSR reveals that the content of CSR has evolved over time (Carroll 1999). In this paper, he starts with the initial definition of Bowen, which is presented above, and presents many important definitions. In conclusion, he points out that the contributions to definition in recent years are less than in 1970s and the focus shifted to new concepts such as CSP, Corporate Citizenship, Business Ethics etc. He expected that new realms would be emerged subject to the new technologies, to new domains of globalized world as well as to commercial applications. In 2000s, proper to this argument, the concept obviously turned to be a business case and CSR was defined in terms of its strategic aspect. Strategic CSR has been defined by many scholars during the previous decade. Some of pioneer definitions of strategic CSR in this manner are:

- Baron 2001: redistribution to appeal to a stakeholder group for the purpose of increasing demand for its products or reducing its costs.
- McWilliams and Siegel 2011: any 'responsible' activity that allows a firm to achieve SCA, regardless of motive.
- Commission of the European Union 2001: A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis (c.f. Dahlsrud 2008)
- Business for Social Responsibility 2003: CSR is achieving commercial success in ways that honor ethical values and respect people, communities and the natural environment (c.f. Dahlsrud 2008).

Finally, Visser (2010) distinguished two definitions of CSR as ‘old CSR’ or CSR 1.0 and ‘new CSR’ (Corporate Sustainability & Responsibility) or CSR 2.0. Carroll and Shabana (2010) too mentioned this distinction to point out the evolution in definition of CSR. Visser’s main argument here is that CSR in the future will be prevailed as a core business case and furthermore the strategic implementation will be in local levels rather than conventional codifications and standardizations. Furthermore, some recently proliferated concepts such as Corporate Social Innovation, Social Innovation, Corporate Social Entrepreneurship can also be assessed in this manner.

3.3. Theoretical Approaches

The realm has been discussed in terms of many theories by number of scholars. Garriga and Mele (2004) handled with the theoretical approaches of CSR and summed up the theories under four subtitles: Instrumental theories, Political Theories, Integrative Theories and Ethical Theories. Instrumental theories are those, which see CSR only as strategic tool and a resource of wealth creation. The focus of these approaches is principally on the relationship between CSR and financial performance. These theories are split into three groups: maximizing the shareholder value, strategies for achieving competitive advantages (which include social investment in competitive context), natural resource-based view and strategies addressing to the bottom of the economic pyramid and cause related marketing (which is relating to reputation and enlightened self-interest). Second group is political theories and this group embraces three subtitles: Corporate Constitutionalism, Integrative Social Contract Theory and Corporate Citizenship. The approaches relating to this group focused on the social power of business, use of this social power and its implementation as addressing local groups. Third group is summed up under Integrative Theories and consists of Issues Management and The Principle of Public Responsibility (Two main theories that made an enormous contribution of strategic CSR, Stakeholder Management Theory and Corporate Social Performance, fall under this group). The last group embraces ethical theories and consists of following categories: Normative Stakeholder Theory, Universal Rights, Sustainable Development and The Common Good Approach.

This comprehensive study indicates that there is no prominent contribution to CSR from RQE approach. However, as it was mentioned in Section 1, the literature over RQE is sparse and the RQE may connote differently to academicians. On that account, it may be beneficiary to look for whether CSR has been dealt through approaches such as SCA or evolutionary

economics. In this manner, there is a remarkable emphasis on RBV, IO Theory as well as Strategic Management. The theories falling under the Instrumental Theories (Carriga and Mele 2004: 53) define three alternative approaches upon strategic CSR: social investments in competitive advantage, RBV of the firm and dynamic capabilities; strategies for the bottom of the economic pyramid. Social investment in competitive advantage reflects the IO Theory as emphasizing the competitive contexts. RBV traces the relationships between CSR and some path-dependent intangible assets (e.g. reputation) as well as idiosyncratic resources and capabilities of the firms. The strategies for bottom of the pyramid have gained more importance regarding to the objectives of MNEs (multinational entities) in recent decades.

Another remarkable taxonomy is suggested by Kitzmueller and Shimshack (2012). As describing the framework of CSR, they present three main channels: Politics, Market and Isomorphism. Politic channel is split into two subgroups as private politics and public politics. Private politics consists of relationships with regulators as public politics contains tension with activist groups. Market channel is also split into two groups: product markets and labor markets. Product markets include subjects such as whether goods with CSR attributes generate differentiation advantage. CSR is of importance in labor markets since CSR can make the firm more attractive for employees. Isomorphism concludes the social and ethical issues. Its strategic importance is assigned through the relative influence of social groups on firm's strategy.

3.4. The Arguments Against CSR

The arguments against CSR can be distinguished as ideological and economic objections. The ideological objections take their roots from the early age of CSR (1950s). As it has been mentioned above, CSR was seen as an alternative system to socialism in 1950s and the main objection was that CSR would harm the free market system ultimately (Levitt 1958). The main argument here was that the tasks of government should not be confused with those of business (particularly those pertaining to welfare of society), since it is hazardous for the profit maximization objective of the business. Furthermore, even this concern is not sufficient anymore and no danger of an alternative system appears in contemporary politics, the recent debates are upon that business may entirely substitute the state and all the functions of the existing democratic system would be carried out by business (Lantos 2001). This is a conflicting point because democratic system would be destroyed in such a system. There is a

need for civil servant in democracy and business does not have any incentives to elect such servants.

Other objections from ideological perspective are uttered by Banerjee (2008). Banerjee has two major objections to CSR: First, discourses of corporate citizenship, corporate social responsibility, and sustainability are ideological movements that are intended to legitimize and consolidate the power of large corporations; second, stakeholder theory of the firm represents a form of stakeholder colonialism that serves to regulate the behavior of stakeholders. The priorities for business and institutions are different; for business the efficiency is the priority as the legitimacy is more important for institutions. There may be trade-offs in this manner and regulations may not aim to protect society from externalities of business at the expense of productivity. Another important issue is that corporations are not motivated to behave socially responsible if the rivals have no CSR activities. Thus, there might be a free-riding problem. Furthermore, particularly regarding to the second argument, the author emphasizes that the entities, that are responsible for mediating the legitimacy of corporations such as NGOs, can be manipulated by those big corporations. In such a case, they may mislead the stakeholders, too.

The debates over economic issues take their roots from Friedman's famous article in 1970. His arguments are upon that CSR is hazardous for profit-maximizing objective of business. CSR is costly, and CSR should at least pay for itself to be feasible for business. Thus, CSR activities ought not to be carried out by firms. However, it is demonstrated in many studies that there is at least no negative correlation between social performance and financial outcomes (e.g. Orlitzky 2003). Friedman sees CSR as 'philanthropy with money of others'. This discourse means that all activities carried out by a firm should be to the favor of the firm itself. Philanthropic activities are just for the glory of shareholders and there is no need to drive those activities with the name of a corporation.

Another remarkable objection of Friedman is that CSR may cause a principal- agent problem. Since managers will drive CSR activities instead of shareholders, CSR policies may vary from those that desired by shareholders. The criticisms based on principal-agent theory reviewed by Salazar (2006). They distinguish strategic CSR from other two forms of CSR – namely altruistic and coercive CSR – and examine how the results vary in terms of each of these three types of CSR. They argue that the consequences may vary subject to the conflicts between the motivations of each of these parties. If both parties (principals and agencies) have

same motivation, for instance if agent and principal both approach from altruistic CSR perspective, then the consequences will be satisfied for both of them. If agent behaves altruistic and principal considers strategic, the results will be same as Friedman's objection. In this case, CSR will be purely philanthropy with money of shareholder and activities would not be for the sake of shareholder. If the motivation for both parties is coercive (being enforced through regulations), then there will be no problem, because objectives are overlapping. Beyond this paradigm, authors expand the objection of Friedman through examining the problem between agent and non-shareholding principals. If the principal is not the shareholder, in other words if other stakeholders such as employees, customers and suppliers are affected by decision of managers, there will be a conflict because of moral hazard and adverse selection. The consequences of strategic CSR cannot be predicted by stakeholders and managers commonly have more information than other stakeholders. Thus, there is asymmetric information. The other important issue is that those activities cause agent costs. This is also important, because the interests of agents and stakeholders may be very different, and it also causes an ambiguity about the costs. Thus, agents may consider on their own interest. Consequently, authors argue that CSR is fruitful if there are strong incentives and motivations for agents to behave to the favor of stakeholders.

As dealing with CSR, it is implicitly stressed that business has a virtue and traditional conflict between society and business is neglected. However, there are still many evidences opposing to this premise. There are many scandals about corruption in big corporations, lobbyism activities, discriminations etc. in business. It can be said that there is no consistency between what big corporations promise and what they do in fact. Marques and Mintzberg (2015) criticize business in terms of four traditional recipes of CSR, which they sum under titles - let them eat cake, the icing on the cake, let them eat cake, having your cake and eating it too. They argue respectively that CSR can only hide irresponsibilities; the slice of stakeholders will be getting smaller, even the pie is getting bigger; doing well by doing good is only a niche rather than a generic strategy (Vogel 2005) and it helps companies to hide their irresponsibility such as lobbyism, corruption etc. (Marques and Mintzberg 2015: 8-9)

4. CSR and COMPETITION

Academia and business discussed over the economic dimension of CSR in 1980s and 1990s more than previous ages. For instance, Peter Drucker (1984) argued in those years that CSR could be used in accordance with interest of business. Similarly, the studies focused on the relationships between social responsibility and financial outcomes in those years. Beyond being normative, CSR was perceived as a positive case and the relationship between CSR and competition examined more in 1990s. Concurrently, the notion of strategic CSR was articulated in this age. Even there are also some other notions addressing the relationship between competition and CSR, 'strategic CSR' is chosen here since it reflects a distinctive approach opposing to blueprint CSP trajectories. However, prior to presenting strategic CSR, it is essential to deal with the relationship between CSR and the RQE.

4.1. CSR and the Red Queen

Particularly in 1990s and 2000s, the CSR departments are proliferated in business. Despite this trend, many of firms indeed saw CSR as a cosmetic activity and they carried out common CSR initiatives such as sustainability reports, coarse diverse management policies or philanthropic activities without any strategic purpose. On the other side, some CSR policies are aligned explicitly with the core strategy and they are implied in pursuit of profit or any other interest. If a firm implies such CSR activities and this creates a variation, it would catch the attention of other firms too and then many competitors may involve in the competition driven over CSR. This triggers the increase in CSR performances and each company will struggle to attain superior performance levels. Since each firm increases investments to CSR and improve the performance, the race over CSR may conclude with the RQE.

The literature that illustrates the relationship between CSR and the RQE is sparse. There are only few papers in this regard. The seminal paper of Barnett (2007) is one of those that mention the statement for CSR that may conclude with the RQE. According to his approach, CSR escalates the expectations of society and firms are exposed to pressure thoroughly to invest more to CSR. Consequently, each firm increases its performance, and this concludes with the RQE.

Bartels and Peloza (2006) examines the effect of reputation derived from CSR in the competition. Due to a survey with managers from several sectors, they observed the motivations to maintain CSR activities. The survey reveals that one of the main motivation is

“to keep up” with other firms. A focal firm that initiates CSR activities ‘sets the bar’ for the entire industry and this causes a RQE, since CSR performances increase reciprocally. In addition, it is also maintained that large firms are exposed to a larger pressure from the public and they are more vulnerable to such a pressure. This premise is also remarkable for RQE literature.

Tetrault Sirsly and Lvina (2016) argue that CSR and reputation are dynamic, and a competition driven through CSR is concluded with the RQE. They explain this as “doing good to reap the benefits of looking good and looking even better”. The RQE can also be seen as thresholds are changed through increasing CSR performances. The industrial characteristics are also influential in the RQE process. On the other hand, Tetrault Sirsly and Lavertz (2007) mentioned the statements that CSR may bring a first-mover advantage. Even though there is no explicit reference to the RQE, the CSR and the longevity of first mover advantage is pointed out in this paper. Authors describe three types of asymmetry among stakeholders (resource preemptions, learning curves and customer cost structure) and contend that if these asymmetries are properly matched with three domains of CSR (stakeholder management, issue management and environment assignment) they can assign better CSR policies in order to possess first mover advantage. As a precondition, they point out that strategy should be based on three characteristics: specificity (being own resource based), visibility (being known by internal and external stakeholders and centrality (being part of core strategy).

Finally, Rammel (2003) contends that sustainability may conclude with the RQE, since it triggers innovation among entire sector. However, prior to this premise, he stressed that the circumstances must be relaxed by government in order to maintain innovations in the industry. Otherwise, since the short-term profits are taken into the consideration, sustainability may conclude with strong market selection and lock-ins which causes standardization and dominant design hindering the perpetual race.

4.2. CSP and Strategic CSR: Boundaries

Strategic CSR is of a particular importance in this realm because it includes an explicit reference to competition. The trajectories identified under the umbrella of strategic CSR usually point out strong mechanisms of value creation. Thus, CSR differs itself from conventional social performance receipts.

In 1980s, two main theoretical approaches gained more ground: Stakeholder Management Theory and CSP. These two approaches are crucial because of their effort based on to conceptualize CSR. Even though they form a broad field for corporations, these concepts remained as (simple) blueprints. Despite their enormous contributions, these concepts have no explicit reference to the relationship between social responsibility and competitive advantage. Instead, such receipts remain as conventional and are easily diffused within entire sector. For instance, almost all large corporations in oil and gas industry have emphasis on oil spills, fatality rates, GHG emissions in their sustainability reports. These annual reports under different names (e.g. Code of Conduct, Social Responsibility Report, Sustainability Report, Corporate Citizenship Guide) present similar sector-specific CSR activities. However, as it is considered in terms of its influence on competitiveness, there seems no unique advantage. This kind of CSR activities are generally undiffused, cosmetic (Porter and Kramer 2002), observable (McWilliams and Siegel 2011), predictable, easy to duplicate and also includes no complexity. Beyond that, since CSP forms a common shape, it conceptualizes the social responsibility policies (Carroll 1979) and this causes a contextualization. Contextualization reflects a statement of low variation in evolutionary economics and thus such type of CSR is likely to conclude with the RQE.

On the other side, CSR, as a strategic tool, may trigger innovations and change the dynamic capabilities. Through this means, the corporation may adopt a strategic positioning (Porter and Van der Linde 1995) in order to cope up with the pressure stemming from regulations. Such an action may generate a competitive advantage since it creates variation and gives first-movers the opportunity of creating new barriers to entries. The conventional researches upon the relationship between CSR and CFP are less aligned with competitiveness than strategic CSR concept, as they promise no consensus over a positive relationship. The variety of these empirical studies may ensue from various parameters. For instance, the consequences of CSR policies may vary because of sectoral differences (Scholtens 2008). Apart from that, each firm should find strategic fit rather than carrying out mainstream CSR tasks. Without satisfying the circumstances for strategic fit, CSR policies may remain diffused. At that point, a brief definition of ‘strategy’ in business is sufficient. Strategy can be defined as “performing different activities from rivals or performing similar activities in different ways” (Porter 1996:62). Any activity or initiative called as strategic must have an influence on the efficiency of the company and differ the company from its rivals in that manner.

To the best of my knowledge, Baron is the first who used the notion of “strategic CSR”. He defined strategic CSR as “redistribution to appeal to a stakeholder group for the purpose of increasing demand for its products or reducing its costs” (Baron 2001). This definition is appropriate to the definition of strategy in business given by Porter; if CSR is used as a strategic tool, it should make the firm more efficient and help the firm create a variation. In other words, differently from altruistic or ethic CSR, the company invests in social responsible activities and reap some private benefits, consequently. Furthermore, successful CSR strategies have to be context specific and should be related with the expectations of stakeholders (Van Marrewijk 2003). In this case, the CSR takes form subject to the priorities in the given context. Van Marrewijk contends that “Each company should choose – from the many opportunities – which concept and definition is the best option, matching the company’s aims and intentions and aligned with the company’s strategy, as a response to the circumstances in which it operates” (Van Marrewijk 2003:2). The companies in different sectors may pursue different CSR policies subject to their activities in the given market. The company’s choice upon how CSR activities are carried out is made in terms of strategic objectives.

Smith (2003) contends that CSR policies should be constructed on idiosyncratic characteristics, since each firm has its own environment and there should be a fit between core strategies and expectations of the environment. Thus, the argument “one-size-fits- all” is not sufficient in this manner. Furthermore, CSR must be assessed relative to the vulnerabilities and opportunities of a particular economic ecology. Through this way, CSR would be a more specific tool regarding to aim of gaining competitive advantage.

In the real world, there are many practices proper to this theory. Nestle and Microsoft are among companies, which really achieved to use CSR as a strategic tool and made profit through their CSR activities. Nestle’s action in India, a well-known example given by Porter (2002), demonstrated how a company can revise its relationship with stakeholders and create value both for itself and its suppliers from the bottom of the pyramid. Nestle’s support to the farmers from the poor provinces of India helped the firm improve the quality of milk, the productivity of these farmers in India as well as to get rid of some costs like provisions paid to middle men. By doing this, Nestle achieved to reduce its costs, improve the efficiency and on the other hand, created value for its suppliers, as well. As thinking from other aspect, Nestle achieved to build a good image, strong relationships with its suppliers. Microsoft, on the other hand, is well known with its support to community schools. Community schools are

those, which address students with lower income level in the U.S.A. In early 2000s Microsoft decided to support students in these schools. Through giving such a support, Microsoft improved the quality of these students, taught them to use complicated computer programs and consequently improved the quality of applicants, those of whom eventually would work for Microsoft. It is obvious that these companies achieved to create value for both society and themselves through this means.

4.3. Value Creation via CSR

As in the evolutionary mechanism, a variation can be created through CSR and this proceeds the transformation. The variation then should be asserted by market mechanisms and converted to a competitive advantage. Afterwards, the change in the characteristics would be adopted by other competitors. Consequently, variation vanishes, and the engine of evolution is replenished again. This is a remarkable point from RQE perspective because CSR may proceed an evolution through increasing thresholds.

CSR policies would stay cosmetic without devoting a special attention to environment specific strategies. The core principle here is that there are win-win situations between society and business. In fact, business cannot stay apathetic to its society. Society means to business the human resource and the market, where it can sell its products. A healthy society with better qualifications is indeed a resource of productivity for business. On the other side, society needs healthy business too. Business is the resource of value creation and is often the loco of economic growth. Thus, the society and business are intertwined. CSR is indeed a way of reconciling with society. Beyond the traditional consideration that there is a trade-off between the interests of business and society, new win-win situations can be created. Furthermore, suitable to Baumol's argument about redistributive and productive wealth-seeking in the second section, Porter and Kramer (2011) argue that the new thinking of CSR is not a sort of redistribution, but instead a means of enhancing the productive capacity of society. Thus, value creation mechanism of CSR is indeed a way of extending the pie, which reflects both the evolution and the development.

Porter and Kramer (2002) describe a competitive context for CSR policies (Figure 3). In this context, the interrelationships between the firm and its environment are identified. They propose that CSR policies can be emerged in terms of those competitive inside-out and outside-in linkages. The competitive context consists of four elements: strategy and rivalry

context, demand conditions, related supporting industries and factor conditions. The firm may assess the priorities and seize the opportunities in terms of these linkages and therefore seek competitive edges. To elaborate the mechanism, strategy and rivalry context corresponds to circumstances under which competition is driven. The rules, incentives, supporting policies for innovation, protecting mechanisms for intellectual property, existence of open markets and so forth, which govern competition, fall under this component. Factor conditions reflect the access of human resources, capital as well as the capacity of the firm. The existence of those factors has an explicit influence on the competition and also the firm may influence such types of resources. Local demand conditions reflect the demand. The existing of customers may influence the operations of the firm in given region or country. ‘Related and supporting industries’ component pertains to relationships with suppliers. Respectively, if the competitive context is properly described, the likelihood of realizing the intersections will increase. Alongside the competitive context, the firms ought to prioritize their CSR activities (Porter and Kramer 2006). Beyond the generic social issues, which are simultaneously known by other competitors too; social impacts affected by operations within value chain as well as social dimensions of competitive context ought to become priority of the firm. Through such a means, firm would be able to identify the lucrative CSR activities.

The Four Elements of Competitive Context

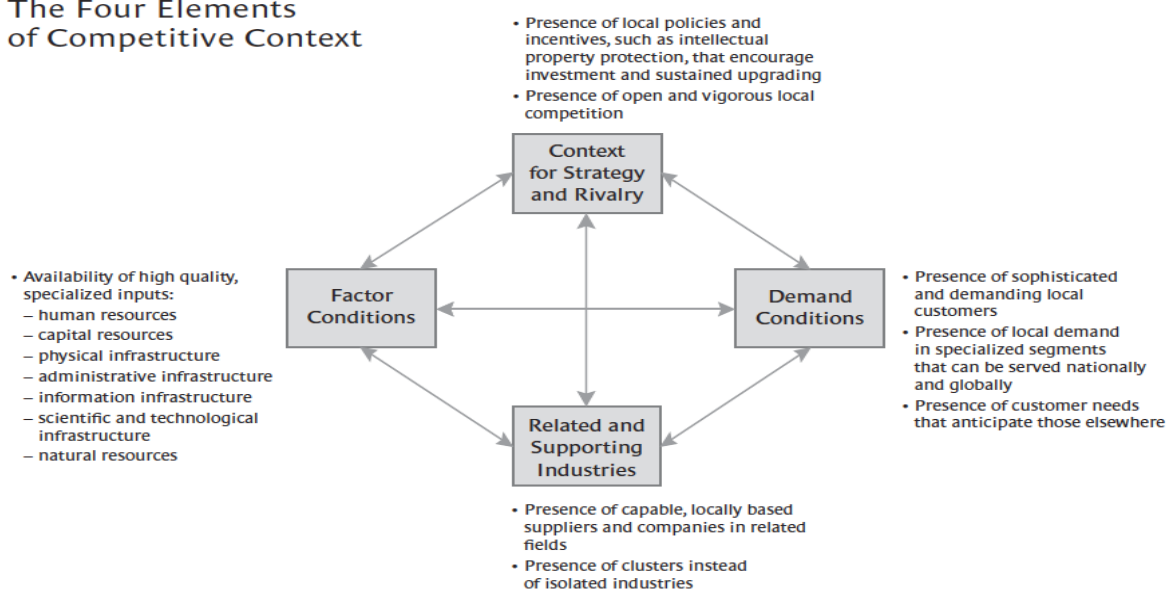


Figure 3. Four components of Competitive Context (Porter and Kramer 2006)

The ‘strategic management’ discipline has a principle argument that there should be a strategic fit as creating a business strategy. This is, the resources and capacity that a firm

possesses should fit the goals. Accordingly, when a company integrates CSR initiatives into its core strategy, these initiatives should fulfill the strategic fit rule. Hess et al. (2002) focused on existing programs, which they called as Corporate Social Initiatives and identified three main conditions to improve the likelihood of corporate social initiatives. These are first; social initiative programs are connected to core values of the firm. This is, the strategy must be based on the culture, values and mission of the corporation. They must be audited and driven by top management within the corporation. Second, social initiative programs are linked with core competencies of the firm. The company should focus on key factors and its core competencies and be able to link them with eventual opportunities. As an instance a company in pharmaceutical industry may use its knowledge and technology to make contributions to campaigns against AIDS in Africa. Thirdly, social initiative programs are systematically evaluated, assessed and communicated to stakeholders. Social reporting and sharing information about activities and product processes would make the corporation more transparent and improve the reliability of the company. By doing this, a company improve the likelihood of success and create a better communication with its stakeholders.

The last major point upon the integration of CSR into corporate strategy is cooperation. A firm may have lack of ability to realize the problems that society encounters. In this case, the firm cannot seize new opportunities and as a consequence, a prospective competitive advantage can be lost. Working with nongovernmental organizations (NGOs) can help the firm to act in a faster and a more efficient way. Brugmann and Prahalad (2008) suggested that firm can use CSR when it enters to a new market and particularly, when it addresses BoP. As doing this, they can pursue a three-stage model; at first stage companies and NGOs realize that they have to coexist; at the second stage companies and NGOs learn from each other as working for the interest of BoP and at the third stage they enter into co-creation business relationships. As a consequence, they can find innovative solutions to increase both the interest of society and business. Value creation concept entails co-operations as well as policies proper to the competitive environment. Even though the trajectory explained here has differences form the theoretical background explained in the second section, it also stresses that there would be a knowledge flow for successful strategic CSR policies. Through competitive context concept, a firm can be more productive and also may adopt inimitable characteristics. Beyond that, through new co-operations with NGOs, it would be possible to build new networks. This may improve the pressure pertaining to transparency on the firm and it may accelerate the learning. Value creation includes connotation of variation. To what

extent CSR creates value, or in other words causes variation is subject to the needs of society as well as constructed networks. Even though CSR would be more transparent through these linkages, a shared value is unlikely to be created without such a knowledge-sharing.

4.4. Strategic CSR Arguments and the RQE

The policies as well as implications of CSR may vary in terms of firms' specific characteristics and priorities. Since each firm assigns a CSR policy in terms of its strategic fit, the arguments may change in terms of each firm's circumstances. The literature over CSR reflects this discrepancy, too. According to Kurucz et al (2008), there are four major arguments for CSR as a business case: cost and risk reduction, competitive advantage, legitimacy and reputation and synergic value creation (seeking win-win-win outcomes). Portney (2008) responds to the question 'why firms engage in CSR' with six major arguments regarding stakeholder relationships: curry favor with customers, to encourage employee loyalty and goodwill, to attract investors, to promote community goodwill, to improve relationships with regulators, to improve the bottom line. According to Porter and Kramer (2006), there are four major arguments for CSR: license to operate, sustainability, reputation and moral obligations. This discrepancy affirms the argument of Dahlsrud (2008) that CSR is a phenomenon rather than a concept. However, even though they point out this statement, Kurucz et al (2008) emphasize that the common characteristics of those arguments is that they purpose to create value for the firm. Thus, it is conceivable to sum up arguments under those four titles: Differentiation, Reputation and Disclosure, Politics, Sustainability. Even sum primary concerns pertaining to CSR are not explicitly mentioned (such as attracting employees or addressing bottom of the pyramid) these four titles embrace a broad range of CSR arguments.

4.4.1. Differentiation

In this section, two major impacts of differentiation strategies are mentioned: product differentiation and differentiation to attract labor markets. A product differentiation can be achieved, if the goods are attributed with CSR. Siegel and Vitalino (2007) argue that CSR is seen as a positive signal of quality. If CSR attributes are added to value proposition of goods, this would be perceived as a signal of better quality. Therefore, there is a demand for those goods subject to some conditions such as consumer awareness, income levels, demographic properties (McWilliams and Siegel 2001).

McWilliams et al (2006) differ vertical and horizontal differentiation from each other. Vertical differentiation refers to statements, when the product is preferred by the majority of consumers and horizontal differentiation refers to statements, when only some consumers value a particular product as the preference is based on taste rather than quality. As an instance, they affirm that hybrids cars reflect vertical differentiation, since less pollution is perceived as more valuable without being experienced. The choice between Pepsi and Coca Cola is a horizontal differentiation as the difference is upon tastes (experiences). Authors' argument is that the customer's willingness to pay for a premium will be higher in the case of vertical differentiation. Accordingly, CSR is likely to gain more importance in the case of vertical differentiation than horizontal differentiation. This may be a reason for investing more, if there is a vertical differentiation that fosters reciprocal responds and consequently improve competition to a superior level. Thus, concerns over differentiation may be concluded with the RQE subject to the demand-supply balance as well as other market properties.

Another important issue in this respect is the private provision of public goods. As an instance Bagnoli and Watts (2004) argue that there will be a customer group that have willingness to pay for CSR attributed goods. Since goods with CSR attributes are likely to be costlier, consumers should be ready to pay a premium, otherwise the costs cannot be offset, and CSR would not be preferable for the firm. However, authors also argue that the effect of CSR may differ in terms of competition level. In the low-level competition, private provision of public goods will be higher. This is, firms will pay more attention to CSR. This indeed reflects the influence of market concentration, which also plays a role in the red queen process. Similarly, Sen and Bhattacharya (2001) argue that there is heterogeneity in the customers' behaviors and the CSR is low in the firms that see a trade-off between CSR and competitive advantage. The heterogeneity of customers may be a signal for existence of social customers and it might be a justification of a strategy that target those groups through differentiation strategies.

The influence of differentiation may also vary in terms of the industry as well as the properties of goods. Siegel and Vitalino (2007) show that the influence of CSR on financial outcomes varies in terms of whether the goods and services are experience, credence or search goods and services. They find that the CSR performance of company selling experience goods (automobile, software) and credence services (e.g. financial services) is higher than those that sell search goods. The firms selling nondurable experience goods or

experience services perform less CSR. Such differences may be decisive over the investments to the CSR and may assess the speed of the red queen process.

Kitzmueller and Shimshack (2012) count ‘markets’ within three channels of strategic CSR as they split markets into two groups as labor markets and product markets. Product markets correspond to differentiation strategies regarding to qualitative properties. CSR policies pertaining to labor markets have focus on relationships between employers and employees. Authors argue that the asymmetric information and moral hazard among those groups may be mediated through active CSR policies. Besides that, firms implying active CSR policies may create a differentiation strategy and thoroughly attract job applicants. Willingness to work for those firms may be higher. Accordingly, Greening and Turban (2000) argue that self-image will be higher for applicants if they work in those firms and this would make such firms more attractive. Alongside this, they contend that firms would gain a competitive advantage, if they have active policies regarding to environment, issues of diversity, treatment of women. Similarly, Lee et al (2012) argue that perceived cultural fit and CSR capability that induce positive CSR perception improves performance. Montgomery and Ramus (2007) show that the relationship between ethical activities and attracting MBA students reflects a competitive advantage. All of these policies change the minimal CSR thresholds and enforce competitors to invest more to CSR. Such a pressure may ultimately end up with a red queen process.

4.4.2. Reputation and Disclosure

One of the main arguments of CSR is reputation. Reputation has of a particular importance in RBV literature because it is defined as a path-dependent asset that difficult to imitate. Since the ambiguity created with reputation, firm can gain a SCA. On the other side, another important argument is that reputation may improve the relationships with stakeholders. Firm can reduce costs, seek the opportunities through those good relationships with stakeholders and lower transactions costs.

The first argument that reputation as a path dependent and inimitable asset is aligned with CSR since CSR includes the signal of quality. Beyond that, consumers react to social irresponsibility more than social responsibility (Sen and Bhattacharya 2001). Thus, being socially responsible, regardless of whether firm is truthful or not as carrying out CSR activities, is assessed by stakeholders. In this respect, McWilliams and Siegel (2011) argue that there will be a differentiation advantage through reputation. This is consistent with RBV

approach, however there is a contradiction between reputation and transparency. Transparency makes the strategy of firms more observable, which enables strategy to be more imitable.

On the other side, as an intangible and cumulative asset, reputation may attract other stakeholders and bring an extra competitive advantage (Branco and Rodrigues 2006). Authors contend that a firm may control and manipulate its valuable, rare and inimitable resources and capabilities to improve its reputation in order to hinder the loss of stakeholder support and further risks. Barnett (2007) articulates Stakeholder influence concept (SIC) and argue that each firm has an influence over stakeholders regarding to the history of these relationships. According to him “[T]he overall logic is that CSR (e.g. philanthropy) increases the trustworthiness of a firm and so strengthens relationships with important stakeholders (e.g., increases employee satisfaction), which decreases transaction costs and so leads to financial gains (e.g. decreased employee turnover, more eager talent pool, union avoidance” (Barnett 2007: 796). This approach reflects the path-dependency, and this is also decisive in the red queen process.

Alongside the influence of reputation on stakeholders, CSR plays an important role in increasing customer awareness and corporate communication. However, the impact of CSR may vary in terms of sector-specific conditions. For instance, CSR can vary subject to the advertising density of the sector. Fisman et al (2007) argue that visible CSR is more prevalent if the advertising intensity is high in the sector (if the firms are more consumer oriented). This is meaningful in terms of the RQE too, because in such a case the investments in advertising may reciprocally increase and turn to an arms’ race. Servaes and Tamayo (2014) argue that CSR advertising will be more efficient if, shareholder’s value maximization is targeted. However, managers should search for better opportunities to improve CSR performance. Furthermore, they argue that CSR is only meaningful if it is aligned with reputation.

Another regarding point is the use of CSR as a component of corporate identity. Fukukawa et al (2007) argue that ‘the integration and emergence of ethical identity is always initiated by one of those forces: the altruistic beliefs of leader; strategic alternatives as gaining competitive advantage in the face of global competition and external forces such as changes in legislation’. If the firm uses CSR to the favor of its strategy, it may gain positive outcomes. As an instance, Nike achieved to make CSR a component of its corporate identity. After scandals unfolded in 1990s, Nike had lost its reputation and their brand image was harmed.

As they struggled with these problems, they achieved to be more proactive in CSR policies and through auditing as well as building closer relationships with suppliers, they improved the reputation again. Their code of conduct reports standardized the company and through this way enforced the competitors as well as local suppliers to fulfill those standards (Lin and Phillips 2008). From the RQE perspective, it is meaningful since it sets the bar for the entire sector and expose rival firms to new competition.

4.4.3. Politics

Apart from direct relationships between business and society in different fashions (such as between company – employees, company –customers etc.) the state also has power to influence the activity of business. Differently from the countries governed by communist or totalitarian regimes, where states entirely involve in economic activity, the primary function of the state in Western countries is to regulate in order to protect the free market system. On the other side, state can partially involve in economic activity as in China, India, Turkey etc. In both cases, some conflicts between the polity and business may occur. To protect itself from eventual harms incurred as a result of such conflicts, business needs to act early, with other words firms ought to have nonmarket strategies (Baron 2001; Baron and Diermeier 2005). For instance, state (as regulator) can raise the taxes with intent to protect the environment or may sharpen some punishments regarding to employee's rights. The active role of the government enforces business to behave socially responsible. If the firm takes precautions earlier, it will be exposed less to the pressure of governments.

The relationship of business with politics can be handled in two domains: private and public politics (Kitzmueller and Shimshack 2012). Public politics include the relationship between business and the regulators while the latter refers to activism of civil groups against business. Authors argue that “[P]otential changes in regulation and related adjustment costs may lead firms to hedge against such an event and build a strategic “**buffer zone**” via **over compliance**, i.e., CSR” (Kitzmueller and Shimshack 2012: 68). Through taking precautions, a company would be able to preserve itself from the risk of losing its strategic marketing position. Another remarkable argument is that CSR is to preempt entry of consumers into lobbying activities as their marginal utility from CSR rises beyond the benefits from “investing” into regulation (through lobbying) (Kitzmueller and Shimshack 2012:69). This can be achieved by self-regulation and both consumers and firms can be better off without

any regulation. However, the success of these activities depends on, whether firms are really aware of activism and even if they, which activist group will be more efficient against firms.

On the other side, firms may change the threshold for CSR and expose competitors to pay more for CSR activities through their relationships with government. For instance, Nike worked in Vietnam with labor ministry to improve the opportunity for handicapped employees (Epstein et al 2010). New standards expose other big corporations, which work with local suppliers as well as suppliers themselves to pay more attention to employee rights. This increases the costs for rivals and lets Nike to have a competitive advantage.

The latter domain mentioned by Kitzmueller and Shimhack is political activism. This refers to campaigns and boycotts carried out by some civil groups, NGOs and so on. Campaigns and boycotts have potential to harm the image and reputation of firms. To struggle with these activist groups, business can behave proactively through self-regulation. Self-regulation may lower the likelihood of becoming a target in an activist campaign (Baron and Diermeier 2005), which ultimately causes new costs and affects the productivity of the company. In addition, having a proactive strategy may contribute to the reputation of the company, as well. Baron (2001) argues that if the firm drive a nonmarketing strategy, if the competition is not intensive, initial demand from activist will be lower. If there is a competition in the market, CSR policies may improve the reputation of the firm as compared with rivals. On the other side, Besley and Ghatak (2007), who identify CSR not only as provision of public goods but also as curtailment of public bads, show that the firms caught out by those activist groups earn lower profits, as more responsible firms earn higher profits.

From the RQE perspective, politics has of importance because of three main reasons; first, it enforces firms to explore new complex and specific relationships. This may help firms to sustain their advantages. Second firms may create barriers to new entrants, if they anticipate such threats stemming from new regulations and this may also be a way of maintaining the competitive advantage. Third, firms have to work with NGOs and other activist groups. This may be decisive on the red queen process, since this entails a proactive information flow between different entities (both firms and activist groups) that accelerates the learning process.

Finally, Campbell (2007) argues that some institutional conditions are required beside economic conditions in order to enhance the likelihood of the success for business. Three conditions proposed are explicitly relating to politics:

- 1. Well-enforced and strong regulations particularly if based on negotiations and consensus.*
- 2. Effective and well-organized self-regulation, particularly if based on the perceived threat of state intervention or broader industrial crisis and if the state provides support for this form of industrial governance.*
- 3. Existence of private, independent organizations, NGOs, social movement organizations, institutional investors etc.*

These three institutional conditions present a conjunction of politics and CSR activities of business. A vigorous struggle with regulations would make the firm less susceptible against the pressure of government, initiates to build more complex and unique relationships subject to institutional changes and through this way, voids the gap between normative and economic rationality that articulated by Oliver (1997). This gap was mentioned in the second section and this corresponds to SCA literature while closing the gap is a means of creating complex and unpredictable routines.

4.4.4. Sustainability

Sustainability is one of the major arguments of CSR (Porter and Kramer 2006). Sustainability consists not only of environmental issues but also includes economic and social aspects. Thus, the policies under sustainability should address those three fields. However, the salient part of sustainability is environment. The notion was first articulated in Brutland Report, a final report of WCED (World Commission of Economic Development) in 1987. While it was concerned about how a better life can be created, this report suggested ‘sustainable development’ conception and described it as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987:43). The notion of sustainable development is a means of reconciling sustainability with development. Sustainability reflects the collision as today vs. tomorrow, intrinsic value vs. natural resources and short term vs. long term (Kuhlmann and Farrington 2010). Development is on the other hand the inevitable objective for both business and national economies.

The notion of sustainability was first put into words under the urgency of environmental problems such as climate change, GHG emissions, water access etc. There have been many international agreements regarding to environmental concerns in particularly last three decades (such as Kyoto Protocol, Montreal Protocol, International Convention on OPRC etc.). The regulations enforced business to take precautions in order to avoid sanctions. Respectively, the vast majority of big corporations proceeded to integrate sustainability into their core business strategies during last three decades. Concurrently, the firms that shifted to long-run, sustainability-oriented business confronted with many uncertainties about the future. The natural resources are not substitutable and are irreversible. Dyllick and Hockerts (2002) classify capital as threefold: economic, social and natural capital and suggest that capital should be saved. If these three types of capital would be substitutable, there would be no difference between producing today or tomorrow. This uncertainty exposes firms to the competition driven over innovation.

The environmentalists Paul Ehrlich and Barry Commoner argue that the total environmental burden (EB) created by human is a function of three factors. These are population (P), affluence (A), which is a proxy for consumption; and technology (T), which reflects how wealth is created. They simply formulate it as $EB = P \times A \times T$ (c.f. Hart 1997: 70). Under this circumstance, the environmental burden decreases, if one of these factors decreases. Population does not appear to be lowered. If the affluence becomes lower, it would make no sense, because lowering consumptions is contradicting to the intention of development. The latter remains as the mere way of mitigating the environmental degradation. This way of thinking is insightful for innovations pertaining to sustainability in business. Proactive firms devote more attention to find innovative solutions and this ultimately assigns the strategic positioning of the firm.

In business, managers need to work proactively against common problems of world such as poverty and environmental issues. This statement compels managers to have a contemporary perspective based on sustainability. According to Weymes (2004), managers should focus on sustainability rather than being profit-orientated, be ready to share more with society as well as be ready to sacrifice short time profits intent to gain long run profits and yield other implicit long run benefits. This stimulates managers to search for more innovative solutions. Even though it may be costly for firms, sustainability may be integrated to the core strategies and through this means, be converted to a competitive advantage. For instance, Nidumolu et al (2009) suggest a means in order to be more innovative and innovativeness is equal to be

sustainable for the firm. They contend that this comes about through five distinct stages: (1) Viewing Compliance as Opportunity (2) Making Value Chains Sustainable (3) Designing Sustainable Products and Services (4) Developing New Business Models (5) Creating next practice platforms (Nidumolu et al 2009). Each problem can be converted to an opportunity. If the firm behaves proactively and integrates sustainability as a core business case, it can adopt discerning routines, which lead it to change the rules intrafirm and interfirm. In order to achieve this, firms can rapidly change their designs of production, may build strong and complex relationships with regulators, pursue more environment friendly policies, product new better-quality goods and so on. This trajectory indeed reflects how business is fundamentally changing. In order to catch up with such changes, contemporary firms tend to be more sustainable and adopt routines that allow innovation. If innovations are carried out perpetually, then a RQE would be seen. The companies are harshly constrained through concerns over environment, the needs of the BoP as well as increasing expectations of Western society. Thus, sustainability as a philosophy, draw the limits of business and change the dimension of the economic system. The sustainability is likely to be concluded with the RQE from many reasons such as spurring innovation, amplifying information share (and therefore learning) among organizations and improving minimum levels of social giving.

4.5. Innovativeness of CSR

As it can be remembered from section over the history and definitions of CSR, the evolution of CSR is an ongoing process. Today, the academicians are likely to confront with a new challenge about the definition and context of CSR. It is argued by many scholars that CSR is far from explicitly addressing the social problems. Hence, the notion of Social Innovation has gained more ground within last decade. Social Innovation is entirely associated with social issues and even the pursuit of profit is neglected in this approach. On the other hand, even though CSR is incorporated and seen as a core activity by many corporations, the pursuit of profit is still remaining in the focus. Thus, there is a gap between social innovation and CSR. It has been tried to fill this gap with some definitions such as Corporate Social Innovation (CSI), Innovative CSR, Corporate Social Entrepreneurship (CSE) etc., all of which are aligned with CSR, while they emphasize social value explicitly.

As it is mentioned above, Social Innovation is not CSR and it pursues no business profit. One of the most precise definitions of Social innovation is ‘a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the

value created accrues primarily to society as a whole rather than private individuals' (Phills et al 2008: 39). The social refers here to some social motivations, intentions, social problems and some legal issues. The innovation has, as appropriate to the theory on innovation, two main characteristics: novelty and improvement. This is, the innovation must be original and present a higher degree of quality. Thus, social innovations must be those that address social problems through superior performances.

Corporate Social Innovation is likely to be seen as next CSR or namely CSR 3.0. Different from SI, this approach still defines the realm as a business case. Many big corporations on the world have budgets bigger than those of many countries, particularly from developing countries. They have a power to solve many social problems easier than governments can do. On the other hand, the expectations from business are increasing and business is confronting with the hazard of losing its reputation within the society. This exposes business to play a more active role in the solution of social problems.

The distinctive property of social innovation is the expense of social giving. The resources can entirely be dedicated to creating social value or corporations can search for new opportunities with the pursuit of profit. The trend in business shifts to be more altruistic and sacrifice more profit to the favor of society. However, firms struggle to be innovative as doing this. This is, as it is mentioned above, the solutions must be novel and improve the quality. In the sense of social innovation, the organization is a catalytic innovator. Catalytic innovation is to think about more simply and less costly solutions for the people, who are overserved or not served at all (Christensen 2006). The solutions such as micro-lending, walk-in clinics, affordable insurances, online classes for the students are some examples for catalytic solutions. If corporations play an initiative role to find such solutions, the likelihood of attaining to a broader customer base will increase. As doing this, corporations should anticipate the time that they implement the innovation. There are number of innovations that are failed because of bad timing. Accordingly, as a business activity, corporations should overcome the chasms (Osburg 2013). This may increase the efficiency.

CSI approach, takes social innovation as a core competence of the corporation. The first step for this is the institutionalization of CSI. This is, the idea of CSI has to be adopted by stakeholders, there should be a cooperation between stakeholders and the organizational structure must redesigned in terms of social innovation CSI (Herrera 2015). From the RQE perspective, it may influence the culture of the corporation. A firm that have more priorities

pertaining to problems of society evolves to a firm that pursue long run based strategies. CSI involves different groups into social innovation. The corporations have to work collaboratively. There may be open innovations, the companies may therefore share knowledge (Osburg 2013). On the other hand, there may be collaboration between business, government and non-profit organizations (Phills 2008), through which a synergy can be created. The knowledge of corporations about organizational structure can be changed with the wisdom of non-profit organizations. Both parties (business and society) can benefit from this situation; corporations can see the problems of society better and on the other side non-profit organizations learn to think more optimally. The dominant approach here is “‘We’ versus ‘I’ paradigm” (Intel 2013) and this aims to be more contributive.

Consequently, a loss of profit occurs in short run through changing philosophy, but this also triggers innovations and also cause a change in corporate culture in long run. Catalytic thinking, collaboration and exchanging ideas between different sectors (Phills 2008) as well as strategic thinking of CSI enforce business to adopt more interactions. Knowledge changing, or information flow may accelerate the red queen process. On the other side, globalization still remains as a crucial issue for business. To be more global, corporations must address bottom of the pyramid more than in previous ages. Apart from that, the environmental issues like GHG emissions, air pollution, water access etc. are crucial for the future of business and each of these issues foster the competition.

5. ELECTRIC VEHICLES (EV)

5.1. EV as a CSR Initiative

As it has been mentioned in the previous section, CSP perspective corresponds to common policies and tasks regarding to the social responsibility of the firm. However, this approach, even it is an enormous contribution in this manner, led firms to imply common and similar policies. Strategic CSR perspective, beyond CSP, leads firms to search for original policies that overlap with the sector specific interest of stakeholders. For car-manufacturing industry, electric vehicle (EV) is the appropriate example in this manner. The concerns of the industry over carbon emissions ensuing from driving enforced firms to imply proactive environment policies. Through concentrating more on manufacturing environment friendly cars, manufacturers create value for society, as they simultaneously address two arguments of strategic CSR (both differentiation and sustainability).

Since sustainability gained more importance and discussed in international platforms during 1990s, car manufacturers also devoted their attention to find new solutions against carbon-emissions. This intention is clearly expressed by many manufacturers. For instance, one of the six largest Japanese car manufacturers Mitsubishi explains their CSR perspective with these words (Mitsubishi 2016):

"MHI believes the basis of corporate social responsibility (CSR) is to engage in business activities that take its diverse range of stakeholders into consideration and return profits to all stakeholders in optimum fashion, while at the same time providing excellent products and technologies to realize a sustainable society and a secure future for people and the planet."

This brief explanation indicates how large car manufacturers intend to react to such environmental problems. EVs are the excellent products that provided as a response to concerns over carbon emissions. Similarly, BMW reinforces its arguments by a conducted materiality survey among stakeholders with purpose of prioritizing its social responsibilities. The fuel efficiency as well as CO₂ emissions were rated with the highest materiality by participants (BMW Sustainability Report 2016). This also reveals that the concerns of stakeholders in this industry are intensified over environment and BMW pays a special attention to manufacture cars causing less carbon emission. The priorities of other manufacturers are also in such a fashion. Furthermore, there are also supporting arguments

from the prominent academicians such as Porter and Kramer (2002). They pointed out that sustainability is one of four justifications among CSR proponents: “The principle of sustainability appeals to enlightened self-interest, often invoking the so-called triple bottom line of economic, social, environmental performance. In other words, companies should operate in ways that secure long-term behavior that is socially detrimental or environmentally wasteful” (Porter and Kramer 2002). Furthermore, this author articulates Toyota’s Prius model as a strong response to concerns over GHG emissions. Toyota launched Prius in 1997 and the model was first offered for sale in 1999. This was a hybrid electric vehicle (HEV), combines conventional internal combustion engine (ICE) with electric. This car basically functions like an ICE car. Despite that, this car achieves to decrease carbon emissions ensuing from driving. Toyota’s social impact was remarkably great; Prius achieved to be a less carbon-emission car and by this means, initiated the foundation of EV market. This success of Toyota is an innovative response of business to a major environmental problem. Furthermore, this was followed by more radical innovations and EVs are now mentioned as example pertaining to sustainability in a broader manner.

5.2. Global Markets and main characteristics of EVs

Electric vehicle does not include only cars but also buses, two-wheelers, three-wheelers etc. However, the cars are the largest group regarding to driving times as well as emission amounts. The cars can be classified in terms of the energy they use. There are three major groups: hybrid electric vehicles (HEVs), battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). HEVs are those that electric is limitedly used, and these cars combine ICE with electric. Electric is used only to propel the engine and the main source of energy is gasoline in these cars. Even though the electric use is very limited, it made a remarkable contribution in order to lower the carbon emissions arose from driving. As an instance, Toyota Prius (2001 model, 1.5 L, 4cl engine) causes 217 gr/mile emissions as a Hyundai Accent (2000 model, 1.5L, 4cl engine) produces 317 gr/mile (Fueleconomy.gov). As it is compared with a BEV, this amount is still very high, but quite low as compared with conventional ICE. The driving range of electric is almost zero. The pioneer models manufactured in a mass are Toyota’s Prius and Honda’s Insight. Prius was first launched in 1997 and first commercialized in 1999. From the date that it was first commercialized until today, Prius achieved to be the market leader (Afdc.energy.gov). HEVs are a revolution for the carmakers because they opened the door of superior technologies. The second group is the plug-in vehicles (PHEVs). These cars slightly differ from HEVs, because electric is also used

as a source of energy. Even though these cars are revolution in the pace of EVs, the driving ranges with electric is still very low in these cars. As an instance Chevrolet Spark (one of the pioneer PHEVs) can only have 35 miles electricity range but 380 miles range as combining electricity and gasoline (Fueleconomy.gov). Existing of gasoline option makes these cars comparable with conventional ICE cars. The third group is the battery electric vehicles (BEVs). These cars are those that can work entirely with electricity. BEVs are emission-free cars and the target of the industry is to manufacture only these cars in the future. The pioneer model of BEVs is Nissan LEAF, which has a driving range about 107 miles (2016 model). Tesla's spectacular BEV models X also achieved to reach 335 miles driving ranges. The BEVs and PHEVs are commercialized first in 2010 and the EV market is relative new. Each type of these cars has played a substantial role in the path of car manufacturing industry to carbon-free driving. The last destination of this path is obviously to have a market entirely consisted of BEVs. However, there are still many shortcomings regarding to infrastructure and some main characteristics of those cars.

The ultimate target in this industry is to product only zero emission vehicles. Even though the market is still small, there are some signals that competition is likely to be fostered. Figure 4. gives an outlook from the global market. The number of total registered PHEVs and BEVs is about 750000 by 2017. Almost half of those cars were registered in China (about 336000). The second largest market is the U.S. market and it is followed by some E.U countries (particularly Norway, Germany, France and the Netherlands). The largest ten markets constitute 90% of global market. The largest share of EVs in the total car market belongs to Norway (29%) as the largest share of BEVs is in China. Almost 75% of EVs in this country are BEVs.

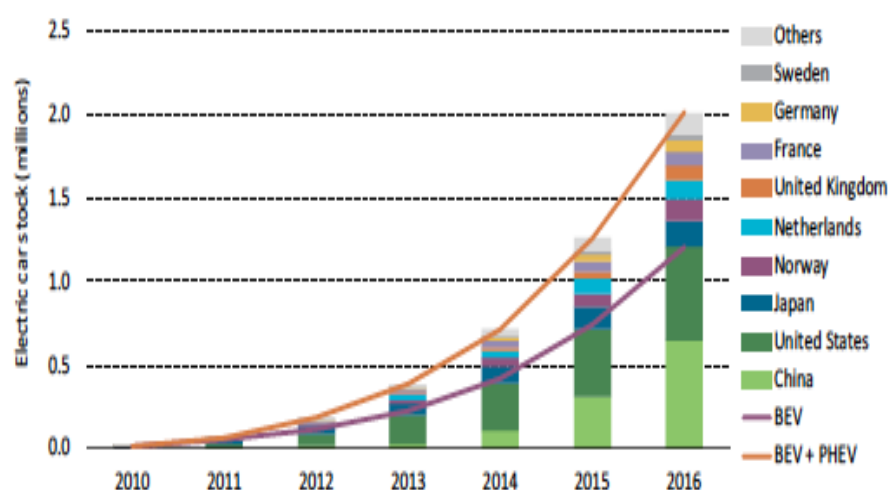


Figure 4. Electric Cars Stock (EV Outlook 2017 (IEA))

The carbon emissions appear for the entire planet as a crucial challenge in this century. In response to this, both governments and business world work for innovative solutions. There are many investments in infrastructure, R&D and deployment as well as new incentives to improve the attractiveness of EVs. These incentives and supporting policies can be summarized as following (IEA 2017): Research supports, targets, mandates and regulations, financial incentives, policies for increasing value proposition of EVs. ‘Research supports’ are those that aim at reducing the manufacturing costs. Battery costs are the remarkable spending items. Two main objectives of business are to obtain raw materials less costly and also improve the existing technology of batteries. ‘Targets, mandates and regulations’ usually aim at reducing carbon emissions arose from driving. These policies particularly take consumers under pressure in order to hinder carbon consuming. The ultimate goal of regulations is to stimulate business to the product zero emission vehicles. The pioneer regulations have been implied in California in 2017 and are likely to be followed soon by other states in the U.S, Quebec (Canada) as well as some states in China. The largest existing markets also stimulate drivers through giving some direct financial supports. These supports can be direct rebates, higher taxes for carbon emissions, tax exemptions in BEV acquisition and so forth. The aim here is to close the gap between total costs of ownerships (TCO) of conventional ICE cars and BEVs. Finally, to improve the value proposition of BEVs, there are various policies in the given leading markets. These are limiting license plates of ICE vehicles, exemption of those in urban areas etc. In addition, all these states work to improve the infrastructure for new battery filling stations. All these policies are carried out in order to reach 2030 targets regarding to carbon emissions. By 2030, it is expected that EV stock will reach 200 million.

Three scenarios regarding to climate change is foreseen: first, two-degree scenario (2DS), which supposes a temperature increase about 2 degrees. Under this scenario, the stock about 160 million is estimated. Second, B2DS (beyond 2D scenario) expects lower temperature change and estimated stock under this scenario is about 200 million. Third, The Reference Technology Scenario (RTS). This reflects the situation that policies on energy efficiency, air quality, de-carbonization etc. are pursued by manufacturers and according to this scenario, the expected registrations will be about 56 million (28 times larger than in 2016).

These estimations indicate that the pie in EV market is extending. Thus, the market is likely to be swarmed by carmakers. This is indeed a signal for RQE. Furthermore, the consumers are incentivized to buy EVs and the proactive support of the government as well as many other international platforms point to a system innovation.

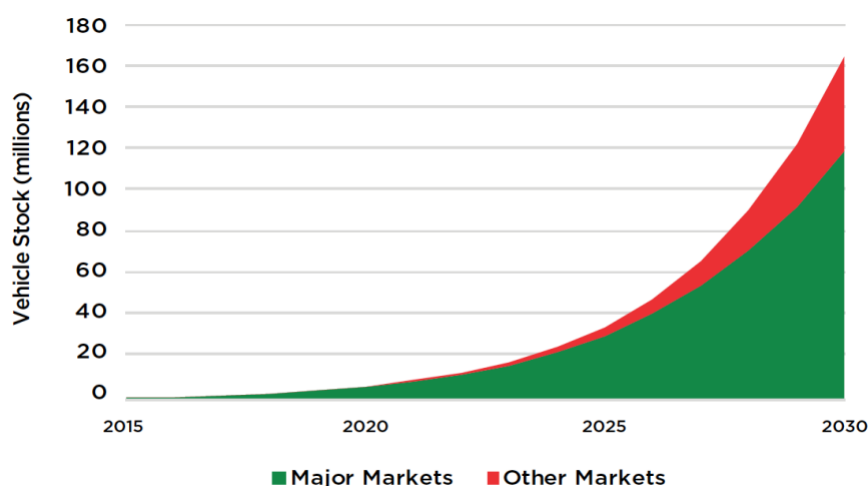


Figure 5. Vehicle Stock by 2030 (IRENA 2015)

5.3. Key Challenges

EVs are tending to dominate the car market within ten to fifteen years. However, the sales number of BEVs and PHEVs are not comparable with conventional ICE cars, yet. Despite the estimations about the demand in the coming years, EVs still have too many shortcomings to satisfy the expectation of the market. The majority of problems in EV market stem from the fact that the technology of battery is still insufficient. Batteries are still not compact enough to satisfy the expectations about recharge times and driving ranges. On the other hand, even though EVs are of advantage in long run, total costs of ownerships (TCO) are also high for EVs. These challenges stem from the lack of technology. TCOs are still high, because

batteries are costly to produce. Driving ranges as well as recharge times also reveal that there is a need to develop the battery technology in order to compete with conventional ICE cars.

5.3.1. Driving Ranges

One of the main challenges of PHEVs and BEVs is driving ranges. Most of PHEVs only have driving ranges under 100 miles with electricity. This is not comfortable for drivers, because lower driving ranges means that the car has to be recharged frequently. Thus, lower driving ranges make EVs less desirable. However, it should be pointed out that there is an ongoing development. Nissan Leaf (2011 model) has driving range of 73 mile while a 2016 model Nissan Leaf has driving range about 107 miles. Moreover, the spectacular BEV manufacturer Tesla achieved to reach 335 miles driving range with their S and X models. This challenge appears for PHEV different, because these cars have option to switch to gasoline every time. For instance, driving ranges of Ford C-Max are 20 miles with electricity and 550 miles with gasoline. However, this technology is also not enough as the objectives about carbon emissions are taken into consideration.

5.3.2. Recharge Time

Another challenge is about the recharge time. The long recharge time affects the comfortability of electric vehicles. Recharging lasts eight hours for some models. This is problematic for two main reasons: first, the infrastructure is not sufficient to satisfy such a demand, the filling stations are not widespread yet. Second, the attitudes about filling should be changed. Opposing to conventional ICE cars, it is more optimal to recharge EVs in the night rather than intraday. However, this triggers new innovations. The need of long time for recharging gives birth to the technologies, which leads customers to recharge cars at home. Furthermore, a new technology, vehicle to grid (V2G), also makes it possible to deliver the electric back from car to the grid. Through this way, customers have the opportunity to recharge the cars in the night when it is cheaper than intraday and spend it during the days. Furthermore, through V2G systems consumers can send the energy back to the grid and avoid from unnecessary electric costs. Similarly, if the electric is loaded from a renewable energy (e.g. photovoltaic, wind energy) source to the car, the car can transport this electric to home and costs will be lowered through this way, too.

5.3.3. Total Costs of Ownership

Another challenge that stems from the lack of battery technology is the total costs of ownership (TCO). The existing technology of lithium ion batteries is not sufficient to satisfy the expectations. Even though large car manufacturers invest more to develop the technology, costs of battery production are still high. Thus, TCO for EVs remains high as compared with conventional ICE cars. On the other hand, driving ranges are dependent on the size of the battery. To obtain higher driving ranges, larger batteries are required. EVs ought to be more competitive and manufacturers need to improve the technology in this regard.

PHEVs and BEVs have higher costs of production than the conventional ICE cars (particularly because of costs of lithium ion batteries). However, as it was pointed out above, there are various supporting policies that aim at encouraging EV buyers. These policies and incentives aim to close the gap between TCOs for EVs and conventional ICE cars. EVs commonly have shorter product life and this leverages the costs, too. On the other side, if the fuel costs are taken into account, this gap disappears, since EVs obviously have lower fuel costs. In Table 2., a comparison of difference types of cars can be seen.

	ICE	HEV	BEV	PHEV
Acquisition Costs	17978	21924	28938	22037
Infrastructure Costs			2036	436
Fuel Costs	6710	4242	2578	3537
Maintenance & Repair	2230	1873	1615	2091
Vehicle Residual Value	(9021)	(10172)	(8164)	(9587)
Battery Residual Value			(5003)	(895)
Total Cost of Ownership	17897	17486	22000	17619

Table 2. Comparison of TCOs (EV Market Outlook 2013)

It is seen from the table that the acquisition costs are quite low for conventional ICE cars as the costs for particularly BEVs are very high. However, as TCOs are compared, the gap gets closer. The TCO for ICE cars are about 18000 as it is about 22000 for BEVs. If the fuel costs are also taken into account, the BEVs would indeed be very advantageous.

5.3.4. Implicit Carbon Emissions

In order to reach goals pertaining to carbon emissions, the electricity production should be carbon-free. Even though BEVs have zero carbon-emissions ensuing from driving, the carbon coming from electricity production cannot be neglected. Particularly in China and the U.S., the carbon dependency is still high. This reflects the fundamental change pertaining to energy production. International entities as well as many developed countries stimulate energy producers to shift focus to renewable energy.

Another issue regarding to carbon production of BEVs and PHEVs is the emissions arose from manufacturing. If BEVs are compared with conventional ICE cars, the emission of manufacturing BEVs is 1 ton more than those ensuing from production of conventional ICE cars. Nevertheless, if the driving emissions are also taken into account, the BEVs have 51% less emissions than conventional ICE cars. (Nealer et al 2015).

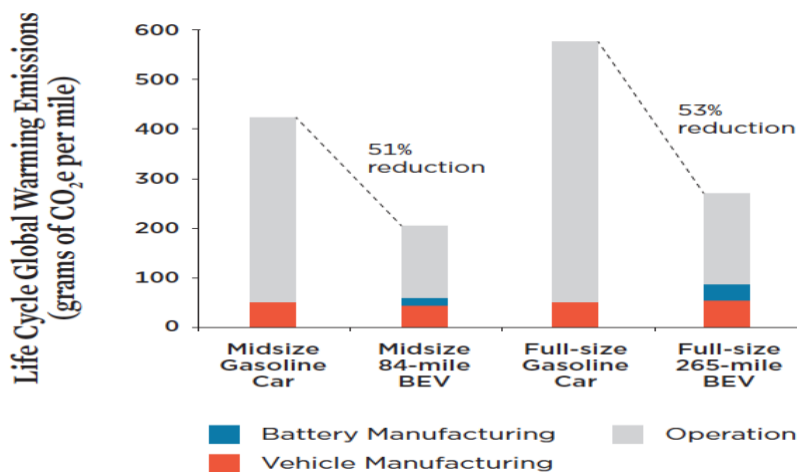


Figure 6. Global Warming Emissions (Nealer et al 2015)

In the figure 4., first a Nissan Leaf with 84 miles driving range is compared with a similar ICE car. Second, a Tesla X with 265 miles driving range is compared with a similar ICE car. It is seen that the emissions arose from driving is very high for ICE cars as the emissions of battery producing and car manufacturing are quite higher than ICE cars. The total amounts of emissions are obviously lower for BEVs. It should be reminding that these are calculated subject to that the product life of a BEV is 135000 miles as product life of a full-size ICE car is 179000 miles.

5.4. Analysis of EV Market in the U.S.

The analysis of EV markets in terms of RQE concept is based on two challenging properties of EVs: Driving ranges and recharge time. To conduct the analysis, the competition based on those characteristics is examined in terms of battery technologies. To achieve this, the data on driving ranges, recharge times and battery specific energy both for BEV and PHEV models are gathered. The data includes all models presented in the market since 2011, the year that first BEV and PHEV models were launched in the U.S. car market. These data are gathered from the official website of United States Environmental Protection Agency, [Fueleconomy.gov](https://www.fueleconomy.gov/feg/download.shtml) (retrieved from URL: <https://www.fueleconomy.gov/feg/download.shtml>) and also presented in Appendix 2..

The empirical analysis of those data is based on the descriptive statistics. Since the sample size is limited with only seven years, it is quite difficult to observe the time-related transformation of the market through using other comprehensive econometric analysis methods. Furthermore, the asymmetry ensuing from entries and exits makes it difficult to examine the evolution. The paucity of data of EV market indeed reflects a common problem regarding to strategic CSR. Since strategic CSR is a relative new phenomenon, it may be difficult to find data including more than a twenty-year period. Through using descriptive statistics such as minimum and maximum values, means as well as variances, it is aimed to observe the changes in characteristics. Maximum values and increasing number of models can be seen from graphs. Furthermore, by using coefficient of variation (CV), the relative change of variances can be observed. CV is a value obtained through dividing variances by means. The formulation of CV is $\left(\frac{\delta}{\mu}\right) \left(\frac{1}{100}\right)$. Through using CV, it would also be possible to compare the changes in each of the characteristics.

5.4.1. Driving Ranges

As it can be seen from Figure 7., the maximum ranges belong to Tesla models. BMW Active E had highest range with 94 mpg in 2011 as Tesla's S Model reaches 335 miles in 2017. The increase in the number of models accompany enhancing performances. For instance, BYD entered market in 2014 with 127 miles range and they reached to 187 miles in 2017. Even though there is a domination of Tesla as of 2012, other companies also gave strong reactions. Beyond Tesla's other two models X (SUV) and 3 (midsize model), Chevrolet Bolt, BYD and Hyundai Ioniq also have remarkable performances. Even though Nissan Leaf was a pioneer

BEV model, its performance is less than many manufacturers in 2017. Another remarkable point is that Toyota have not maintained its success of HEVs in BEV markets (Toyota RAV has 104 miles range performance). According to the changes related to ranges, Tesla gained a big advantage and dominated the market over the period from 2012 to 2017. The strong reaction of Chevrolet and BYD are still far from the performance of Tesla.

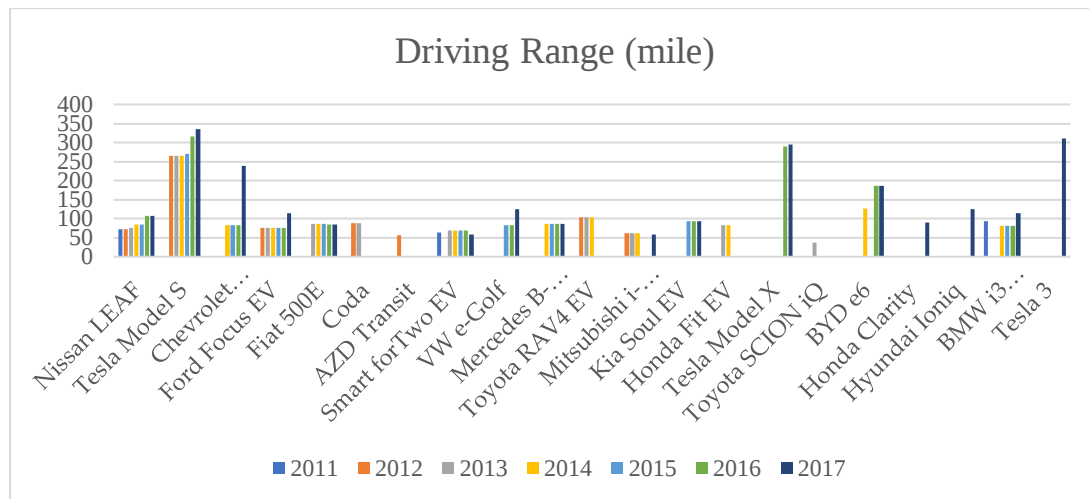


Figure 7. Driving Ranges BEVs

From Figure 8., it is seen that most of the models have still low and close driving range performances in PHEV markets. As it is compared with BEVs, the option of gasoline lets PHEVs be more flexible in this race. Thus, driving ranges does not appear as a major problem for those cars. For instance, driving range for Mercedes S550 (2015 model) is 432 miles with gasoline and 14 miles with electric (Fueleconomy.gov). However, there is also a remarkable demand to emission-free cars and customers are stimulated by government through several policies to buy these types of cars.

In this market there are no remarkable performances in last years except BMW and Chevrolet. This is important as this reveals that the first movers are still in the race. As it can be seen from Figure 8., these two models and Ford have been in the market since the market was emerged. However, the big lap of BMW catches the attention too in this market, since BMW has not only better driving range performances, but also it is the brand that presents many models in different segments.

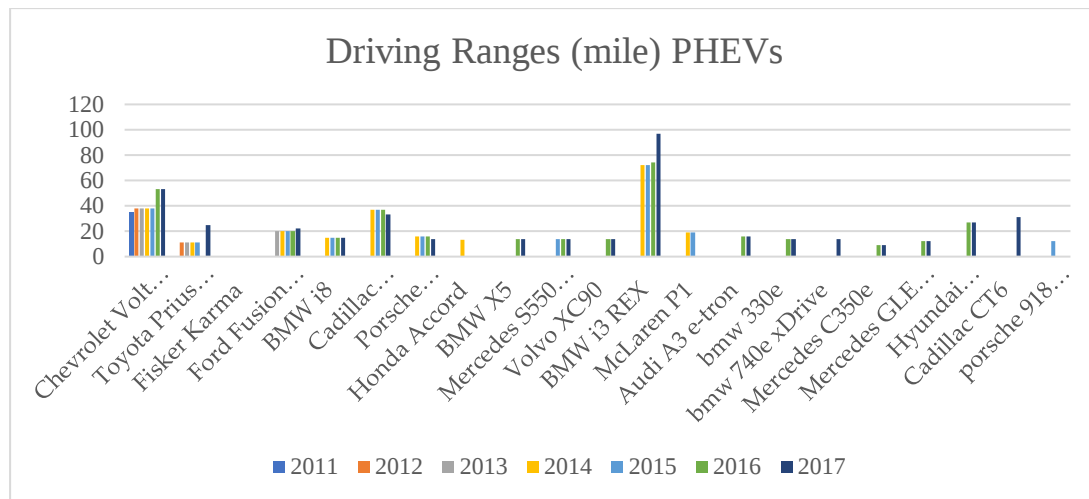


Figure 8. Driving Ranges PHEVs

From Figure 8., it is seen that there are number of models that remained in the market for one or two years. This is an expected reason for a recently emerged market. The maximum range reaches from 35 miles to 97 miles in 2017, which confirms that the progress is going on. On the other side, the constant progress of first mover Chevrolet Volt is going on. Even BMW i3 reaches 97 miles, Volt is the second best. In addition, it is also remarkable that there are still number of companies that shows no signal of progress, for instance Toyota Prius has 11 miles until 2016; Ford Fusion and Energi models have 20 miles until 2016.

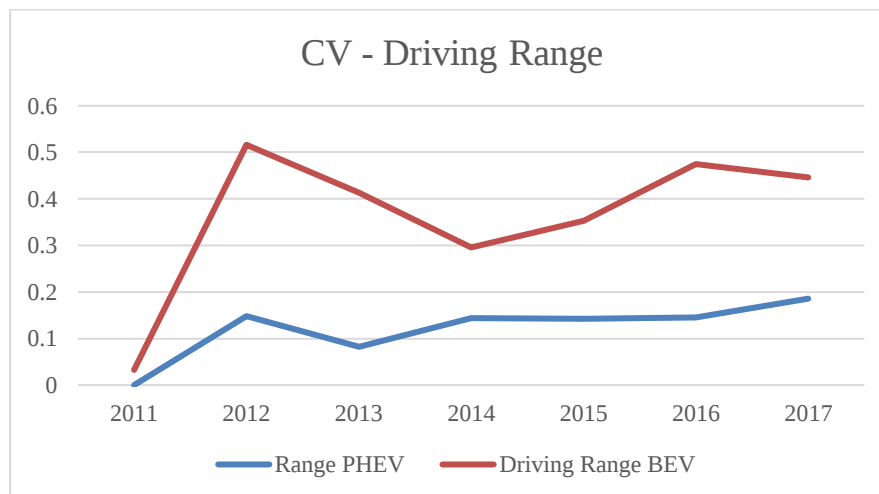


Figure 9. Coefficient of Variation: Driving Range

CV values indicate the change in the variance relating to means. From Figure 9., it can be seen that the change of CV of BEVs is quite high as compared with PHEVs. Low value of CVs for PHEVs affirms the harmony between means and variance for PHEVs. The main

reason for such low values is that the performances were low in PHEV markets and there seems no remarkable progress until 2017. In the last year, some strong attacks of BMW and Chevrolet causes an upward trend in CV. On the other side, higher values of CV of BEVs is stemming from the remarkable performances of Tesla. Tesla's performance in the market is still the main reason of high variances. The peak in 2012 disappears in 2014 as a result of new entries to the market. However, increasing performance of Tesla proceeded the increase again until 2016. As these markets are compared, it is seen that CV is higher for BEVs in all years. This indicates that the evolution in BEV market is fiercer than in PHEVs. The main reason for this statement is the radical performance of Tesla. Tesla pioneers the evolution in the market and has very discerning performances as of 2012. Tesla S has a driving range of 315 miles in 2016 and 335 miles in 2017. Furthermore, the variance is increasing incrementally every year. This can be seen as a signal of SCA and indicates that there is no RQE in BEV market, yet. In PHEV market, the situation is a little bit different. The gasoline option slows down the transformation and this is akin to the strong-form constraint argument of Barnett and Pontikes (2008) mentioned in the second section. The aspirations are adjusted in inferior performance levels and in such a case RQE as well as coevolution comes to end.

5.4.2. Battery Specific Energy

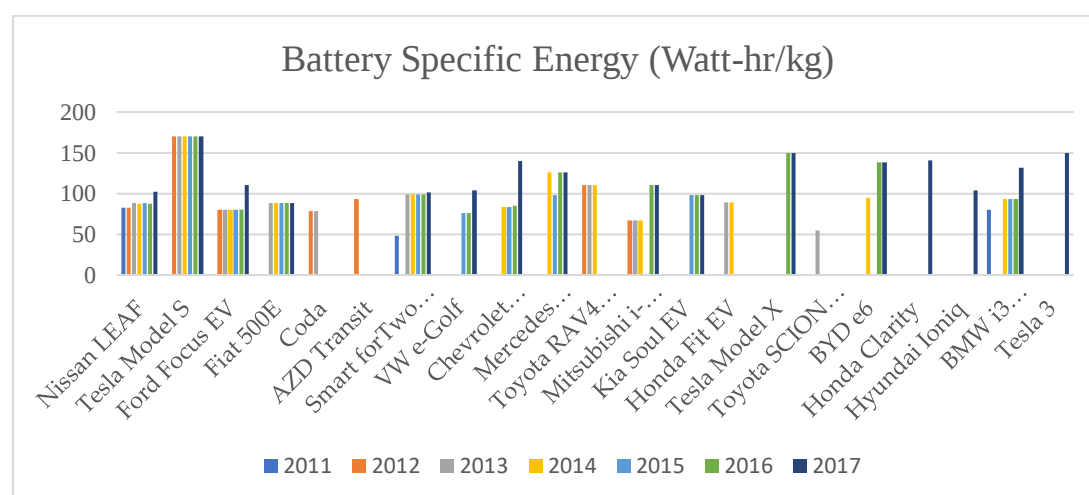


Figure 10. Battery Specific Energy BEVs

Battery specific energy is important, because the vehicles with higher battery specific energy can store more energy. This directly influences the driving ranges (To note, there is no perfect correlation between ranges and specific energy). As it can be seen from Figure 10., Tesla has the leadership here and this is the reason that they have better performances of driving ranges.

However, the difference between Tesla and others decrease in 2017 and this is also consistent with the change in driving ranges. One of the main differences from the ranges that appears here is the minimum values' incremental increase in each year. On the other side, the maximum value is constant from 2012 to 2017 (170 Watt-hr./kg) and this indicates that other models could not reach the technology used by Tesla, yet. Tesla's performance has indeed reached comparable values with traditional ICE models and on that account, there is no reason for consumers not to prefer Tesla regarding to concerns over driving ranges.

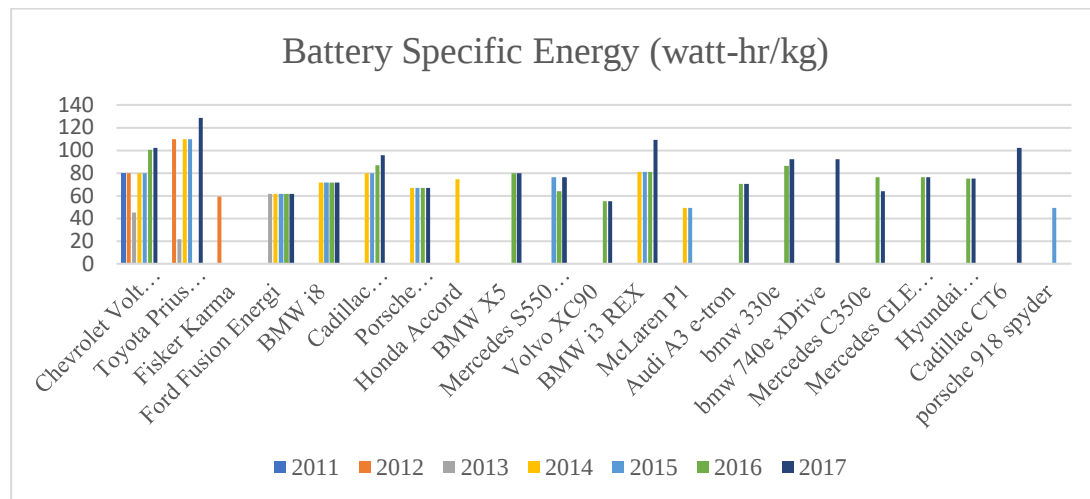


Figure 11. Battery Specific Energy PHEVs

It is seen from the Figure 11. that all models have close performances in PHEV markets. This indeed indicates that there is no remarkable progress regarding to battery specific energy. However, as it is compared with particularly low values in 2013, the increase is meaningful. Toyota Prius has a remarkable action in 2017 and this is important for the dominant car maker in HEV market. Apart from that, the better performances of Chevrolet and BMW can be seen here, too. If the performances are compared with the BEVs, it is seen that BEVs have higher battery specific energy.

The change in CV can be seen from Figure 12.. Except 2012, there is a decrease in CV of BEVS until end of the period. The increase in 2012 is the reason of variety created by Tesla. The decrease in following years is a reason of reactions to Tesla's radical effect. Particularly in 2017, CV comes to 0.044, which is a very low value. This stems from the strong actions of BYD, Hyundai Ioniq and Chevrolet Bolt. These changes give strong signals for the RQE among the established car manufacturers. Furthermore, it is seen from Figure 12. that PHEV market has lower numbers than BEVs in each year. However, the trends are like each other

and the CV is quite low in both markets. In 2017, the numbers are almost equal to each other. This reflects that transformation comes about slowly. Battery specific energy reveals that the technology used is same. This may be a consequence of ongoing technologic progress and common or similar technologies that car makers possess. From SCA perspective, it is meaningful, because in such a case there will be heterogeneity of resources. In addition, it should be pointed out that small change in PHEV market in 2017 may also be a consequence of increasing values of BMW and Toyota. To conclude, there is no meaningful transformation that can be observed over battery specific energy.

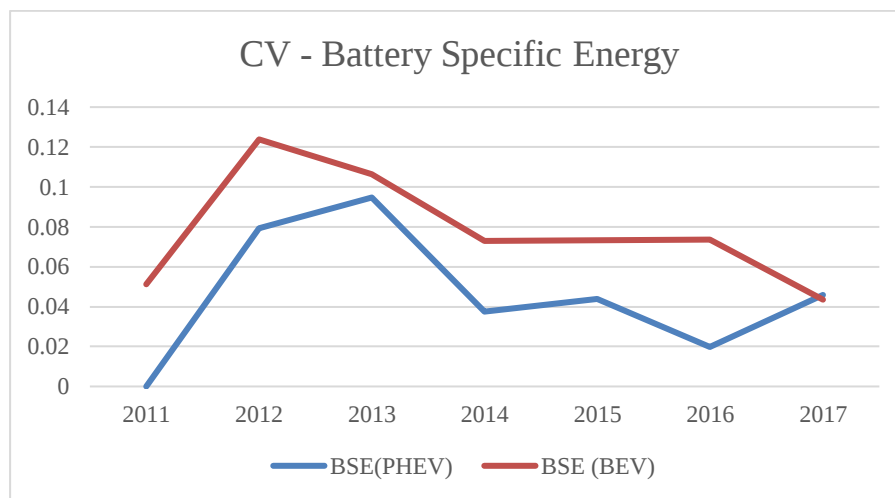


Figure 12. Coefficient of Variation: Battery Specific Energy (BSE)

5.4.3. Recharge Time

Recharge time is one of the major concerns for EV manufacturers. For consumers, the cars with lower recharge times are more desirable. Tesla, the brand that achieves highest driving ranges, achieves recharge time about 4.75 hours with their A80 dual charger option. The second highest driving range performing models of Chevrolet (2015-2017 Spark and as of 2017 Bolt) have the worst recharge time performances by 2017. Besides that, Mitsubishi is the other brand that could not achieve to develop its technology. Nissan Leaf, as the first mover, has recharge time about six hours in 2017 and there seems no clear progress.

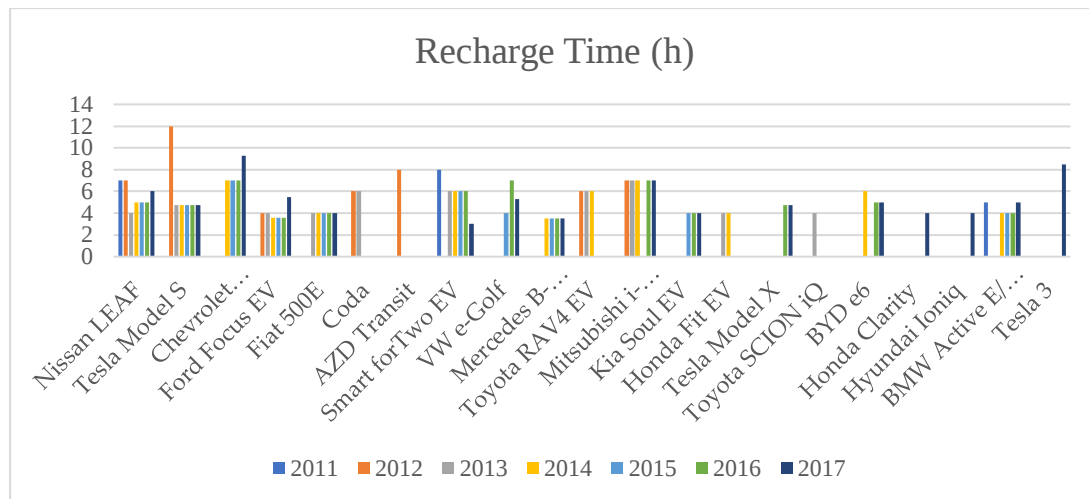


Figure 13. Recharge Time at 240 volt BEVs

There are indeed many models heaped up between four-five hours recharge time in 2017. This is a signal of a technological progress; however, the values are still far from the ideal values. On the other hand, the minimum value decreases from five to three hours (Smart) in 2017 and this is a signal of positive change. The desired EVs are those with lower recharge times and higher driving ranges. On that account, Tesla has also relative competitive advantage regarding to recharge times. The race is likely to continue until models like Chevrolet (Bolt) and BYD (6e) also achieve to have lower recharge times, but in the given situation there is no RQE.

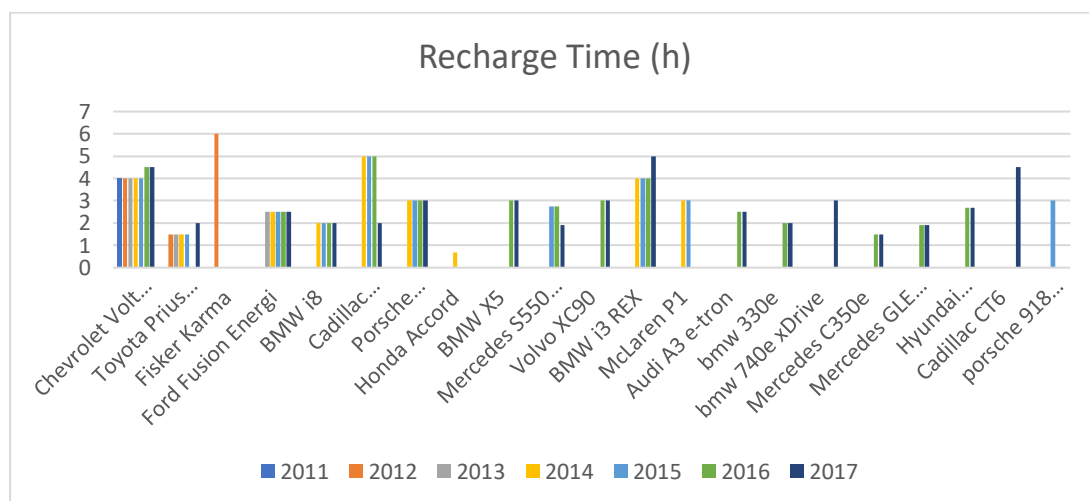


Figure 14. Recharge Time at 240 volt PHEVs

In Figure 14., it is seen that there are very remarkable recharge time performances. For instance, Honda Accord (2014) reaches 0.67 hours performance. Honda is a pioneer car

maker in HEV market and this indicates that Honda is still among important players in the market. Besides that, the performances are close to each other in last years, except some models such as Mercedes C530 and Hyundai Sonata / Kia Optima. The models are heaped up about three to four hours. This may be assigned as a signal of the RQE, however there is still an early stage of the market and technology will likely change very fast in coming years.

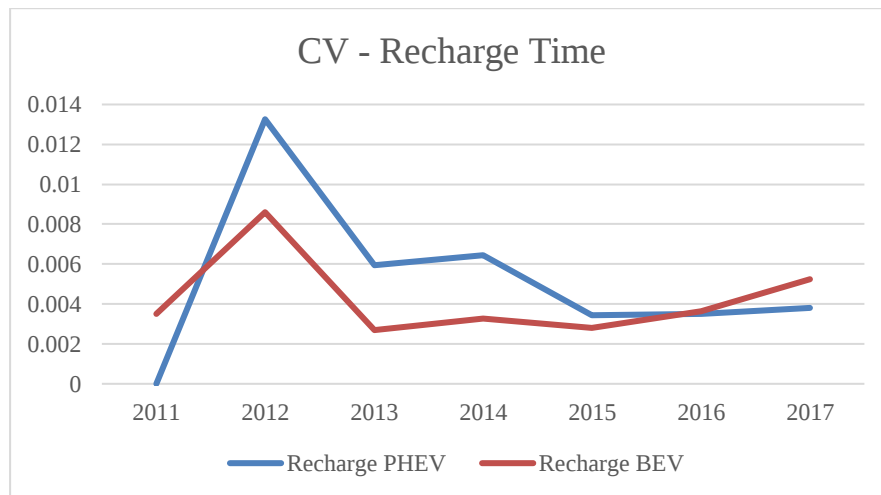


Figure 15. Coefficient of Variation: Recharge Times

The increase of CV for BEVs in 2012 reveals that the change in the variation is high relative to the change in the means (Figure 15.). The lower values until 2016 came to end through increasing recharge times of Chevrolet Bolt and Mitsubishi. This may justify that car manufacturers close their eyes to such battery designs enabling higher driving ranges at the expense of better recharge times. Consequently, even though there are many models with four-five hours battery charge times and even though it is a signal for the RQE, Tesla has a relative big advantage here, too. On the other side, CV for PHEVs declines after 2012 (while many new models entered to the market). Despite a short run wave, the variation is constant and low. This indicates that companies have closer performance to each other and no remarkable respond appears. As it is compared with BEV market, it is seen that CV are very low (in 2016 0.0005 in BEV market and 0.0004 in PHEV market). Furthermore, differently from PHEV market, where CV remains constant, the increase of CV values in BEV market is going on. CV may give some signals that the variation is ongoing in BEV markets.

To conclude, it should be pointed out that transformation can be seen more clearly in BEV market. It is seen that competition is fierce there and Tesla's pioneering role would foster the competition. However, Tesla's performance is far from being replicated. There is an obvious

domination of Tesla in this market. In PHEV market, it is a little bit different. The market is likely to be misled through adjusting aspiration levels. Since there appears no intention of pioneer car makers about increasing performances, the other competitors also have lower performances. Another notable statement is that the competition is harshly driven over driving ranges. The CV values are relatively high for driving ranges. This may be a reason of that customer's major expectations are upon driving ranges.

5.4.4. Sales in the EV Market

Finally, an outlook of sales in EV market is presented in Appendix 3.. Number of sales reveals that the market is dominated by Tesla and Nissan. Tesla's large size S Model and Nissan's midsize model Leaf have obvious dominance in the market. Even though Nissan's sales decreased in 2014 and 2015, they have highest sales in 2017. This may be a result of first-mover advantage for Nissan. Despite remarkable market shares of many other rivals Nissan keeps its advantage in the market. Tesla, on the other hand, strikes as the main player of BEV market. Tesla has dominated the market with S model for long years, while it achieved to be one of two pioneer brands in the market. Tesla's intention of being the most dominant brand in the market can be seen through its establishment of new models in other segments too. The number of sales are still low for the remaining brands. The distance between two pioneers (Nissan and Tesla) and rivals is quite big and only BMW has relative high number of sales. This indicates that there is no RQE yet and couple of brands achieve to keep their position in the competition.

In the PHEV market, it strikes even similar to BEV market. There are two main car makers that catch the attention at the first glance. These are GM (Chevrolet and Cadillac), Ford and they are followed by Toyota and BMW. This is consistent with the entire U.S. car market since these are brands are among those that have higher market shares in the entire market. This may stem from that gasoline option exists in PHEVs and these cars may be perceived as conventional ICE cars. Moreover, this statement indicates that aspiration adjustment plays a role here and firms may opt to devote their attention to BEVs rather than PHEVs. Thus, there is no RQE in PHEV market too (due to aspiration adjustment).

Finally, as sales are compared with the characteristics, sales are partially related to characteristics. The domination of Tesla is consistent with its superior characteristics, particularly with driving ranges. However, there are many rivals that have better quality than

Leaf and despite their remarkable market shares in the entire car market, their sales are still behind Nissan Leaf. There may be thus a first-mover advantage here. In PHEVs, there is a consistency between sales and the market shares in the entire market. Besides that, the relationship between characteristics and sales is blurring. BMW and Chevrolet has better performances and this is partially consistent with the sales.

5.5. Discussions

Prior to the discussions over the analysis of EVs and CSR literature, it should be stressed that EV is a remarkable recent example for strategic CSR. As it has been mentioned above, CSR should be considered beyond the conjecture of CSP. The sector-specific examples reflect the situation of the firms in the competition better than cosmetic blueprints of social performances. In this master's thesis, the focus is upon a strategic CSR initiative. The literature of CSR affirms that CSR may have remarkable effects on competition particularly in two ways: first, it can be a source of SCA, this is it can be path-dependent, creates causal ambiguity as an intangible asset and therefore becomes an idiosyncratic strategy. Furthermore, some inimitable relationships with stakeholders that may be created through CSR activities. Second, CSR may trigger the innovation and provides superior technologies or routines. The innovation may foster the competition and the firm gains a competitive advantage. EVs, which are likely to substitute conventional ICE cars entirely by 2030, catch attention of many car manufacturers and tempt the entire industry to be involved in a race driven in EV market.

The findings would be discussed here in terms of the questions asked in the second section: Does CSR have an innovative impact? Is CSR a SCA? Is CSR easy to respond? Even if it may remain contested, to what extent literature over CSR and the analysis of EV market respond these questions, this may at least initiate the further discussions from the RQE perspective.

First, literature affirms the value creation mechanism through CSR. If the firms achieve to identify competitive context as well as inside-out and outside-in linkages properly, the likelihood of gaining competitive advantages would increase. The concerns over sustainability of the firm triggers to find innovative solutions. If once firms achieve to make innovations, they would assign their strategic positioning. Beyond that, if the firms achieve to describe their strategic fit properly, this is, if the endogenous factors such as resources,

capabilities, organizational structure and culture fit the objectives of the firm, they will enhance the likelihood for success. The other factor that influence the success of CSR is working with society. If a firm works with NGOs and activist groups, it may accumulate more knowledge about the expectations of society and this also enhances the likelihood of success.

The literature responds the second questions over RBV Theory. Reputation is particularly seen as a source of SCA, since reputation is obtained according to a process reflecting causal ambiguity and path-dependency. This may make reputation inimitable. However, being transparent is crucial and if there is a transparency, the strategy established through CSR would be observable, thus imitable. Beyond that demand of CSR entails to enhance the capacity in order to supply sufficient amounts. This may trigger the innovation, as well. Finally, the success of CSR depends on the gap between economic rationalities and institutional norms. In order to gain a SCA, there should be a fit between institutional expectations and economic objectives.

Pertaining to third question, it may be said that CSR is a common outcome and is observed by other rivals, too. However, if a firm achieves to create inimitable relationships with stakeholders, it may be difficult to copy CSR or adopt CSR through information flows or knowledge pools. Alongside this, if CSR triggers innovation and a value is created, then the analysis of CSR would turn to an analysis of innovation. Whether firms achieve to respond to such innovative actions is the center of the RQE theory. The arguments such as CSR as communication tool or CSR as a part of disclosure policy may not correspond to such strong reactions. However, there is an explicit contribution here. CSR may trigger the change in the culture of the firm, which may obsolete the routines and inertias that prevent efficient innovative policies. Organizational learning perspective is focused on social constraints. Recent experiences with particularly different cohorts lower the failure rate of firms. If the firm has recent experiences over CSR with different groups of society, the likelihood of failing will lower.

The analysis on EV market of the U.S. is also insightful regarding to questions asked in this master's thesis. First, EVs are stemming from the concerns over sustainability, one of the main arguments of CSR. The concerns of car makers over GHG emissions initiated to manufacture environment friendly cars. This triggered corporations to adopt superior technologies. This process then is concluded with opening up of new markets. HEVs, PHEVs and BEVs are the conclusions of such concerns regarding to sustainability. Even though the

performances of those types of cars are far from to compete with conventional ICE cars, the market caught the attention of big players. Appropriate to the objectives of the industry by 2030, the performances of BEV and PHEV models are increasing. However, the variation created by Tesla is a destructive impact and this accelerates the transformation in the market. It is seen from the analysis that Tesla's performances in driving ranges is still at the top in the market. Thus, Tesla's performance indicates that there is still no RQE in EV market. However, the performances of recharge times indicate a concentration in a range about four to five hours. Furthermore, it is seen that EV is likely to turn to a dominant design in the market. The infrastructure is changing, and a system innovation is spurred through changing regulations, stimulating policies as well as changes in customer preferences. The innovation in micro level (first electric car) was tested in meso level (universities, exhibitions, international platforms such as World Economic Forum, IRENA) and technology was disseminated through several channels within time. In the macro level, such policies and support of governments accelerated the process of diffusion. Furthermore, some investments in infrastructure and some technologies like V2G also indicates the system innovation. This is appropriate to the literature over co-evolutionary economics that mentioned in the second section (particularly by Geels, 2005). It should also be pointed out that number of sales are still low as compared with conventional ICE cars. In these early years of EVs, it is indeed not astonishing, however the registrations of EVs would increase in coming years. Even if there is no RQE in the EV market, this coevolution (system innovation) is likely to conclude with an equilibrium including more players on superior performance levels.

The performances regarding to driving ranges (battery specific energy) and recharge times become closer to desired values. However, Tesla's remarkable performance could have not been imitated by other rivals in last five years, despite some exceptions. Furthermore, the first-mover Nissan lost this advantage in BEV market. On the other side, the performances are expected to come same performance level subject to the dimensions of EV market by 2030. Another interesting point is that technological innovations like V2G may change customer's attitude of electric consumption entirely and lead people to use more renewable energy. On the other side, filling stations are going to become widespread and this is likely to increase EV sales.

The second question (whether there is a SCA) can be responded through relationships with suppliers and market concentration. Even though performance parameters of EVs used here are not sufficient for this question, it is known that lithium ion batteries are the main energy

sources for the whole industry. On the other hand, the market concentration is high in car manufacturing industry and there are number of large firms that have similar resources and capabilities. There is a homogeneity in the market and it is quite difficult to obtain inimitable routines. This is also indicated through simultaneous entrants of different car manufacturers. Even though there is no indication about it, Chinese brands may have some advantages stemming from demographic properties, such as lower labor costs, economies of scale and being directly established in the largest EV market (China). Thus, it is quite difficult to argue that EVs present a SCA for first movers.

Third question can be answered over interrelationships among competitors. Social constraints can be detected here. There is an information flow in the market and the all manufacturers use similar technology of battery. All competitors use lithium ion batteries and achieve to enhance the capacity of raw materials as well as develop new technologies in this regard. The brands that have experience of competition are the large firms here and they have operations all around the world. All of the pioneer brands are firms that have recent competitive experiences and are within competition for a long time. Differently from the majority of firms in the market, Tesla has operations in renewable energy and aerospace industries and it may be meaningful to point out. The experiences in these two industries correspond to a concurrent race in different cohorts. These experiences may be contributive to explore in the EV market and present higher performances.

To sum up, both literature over CSR as well as the analysis of EVs indicate that CSR may be a means of value creation through innovation. Furthermore, CSR is a source of reputation and that is also a SCA. On the other hand, the co-evolutionary economics trajectory affirms that EVs gradually turn to dominant designs and first movers are pursued by other rivals on that account. There are many interrelationships that can implicitly influence the strategic positioning of rivals. Cooperations and alignments with manufacturers as well as relationships with suppliers may trigger the transformation in the sector. Even though EV market is new and not matured yet, there are number of signals for transient advantage. However, in the early years of the EV market, there is still no RQE.

Finally, there are some words for future discussions. First, RQE is not a theory, but instead a phenomenon. From this reason, it may connote differently to each academician. Thus, the methodology of the RQE may differ. For instance, Barnett and co-authors (Barnett and McKendrick (2004), Barnett and Sorenson (2008), Barnett and Pontikes (2002)) observe RQE

through the relationship between failure rates and distant and recent competitive experiences. Lampel and Shamsie (2005) observe the relationship between performances and investments (both of itself and rivals). Principally, studies upon the RQE should reveal the reciprocal relationships (action-reaction dyads) and involve evolutionary perspective into the analysis. Furthermore, RQE, like other evolutionary studies, entails historical data that presents the transformation of each firm. Thus, the paucity about data in this master's thesis may be a common problem and it is likely the major reason of a more significant analysis. Second, strategic CSR is usually context-specific, and activities aim to generate local competitive edges. Thus, it is difficult to detect how and to what extent rivals respond to the focal firm. Furthermore, as it pertains to strategic CSR activities, it is quite difficult to detect common parameters, over which competition can be observed. The relationship between CSP and financial performance is not sufficient regarding to strategic CSR. EVs allow to observe performances, which are common for entire sector. However, it should be pointed out that a more significant analysis of EVs can be conducted in coming years, since a larger sample size can be obtained with the increase in number of models.

6. CONCLUSION

The purpose of this master's thesis is to examine the realm of CSR from the RQE perspective. Rather than empirical studies focused on the relationship between social performance and financial outcomes, a sector-specific strategic CSR initiative is examined here. In this respect, the EV market in the U.S. is analyzed in terms of its crucial characteristics. The competition among car manufacturers was observed through descriptive statistics and it is aimed to respond the questions asked in terms of the theoretical background presented under the RQE umbrella.

Prior to the analysis of EV's influence on the competition, the literature over arguments of strategic CSR provides an insight upon that CSR triggers the innovation and through this way, creates variation. Furthermore, it is inquired whether CSR is learned and adopted by rivals in a short period of time; whether it is an inimitable asset that generates a SCA. The literature affirms that CSR may create value both for society and firms and this may cause a variation. On the other hand, if the resources and capabilities are controlled and manipulated, a SCA can be generated through reputation and employee attraction. Beyond that, CSR may serve for the sake of firms that prioritize sustainability. EV is a mutual example for two main arguments of strategic CSR presented in the third section: differentiation and sustainability. The concerns of business in this respect trigger new innovations. EVs are examples of radical innovations. On the other hand, EVs are evolving as described in the second section: an innovation created by a firm is disseminated and gradually turned to a mainstream dominant design. The current evolution is particularly intensified on the challenging characteristics of those vehicles. Recharge time and driving ranges, which appears as the main challenges, foster the competition in the market and firms struggle more to come comparable performance levels with ICE cars. On the other hand, a system innovation appears too, which indicates the co-evolution in this market.

The analysis over some technological characteristics such as driving ranges, specific battery energy, recharges time indicates that there is a fierce competition in the market. The increase of means can be seen as a signal of improvement in the whole industry. Means are constantly increasing. On the other hand, variation has no constant tendency, since there are still some radical individual improvements in the industry. Even the market is in its early age, there are many signals for a RQE. However, it is also important to remind that the total number of manufacturers and models is still low. Nonetheless, given that the market concentration is

high, it is expected that other carmakers will enter into the market in a short time and proceed an intensive red queen process.

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Internet Sources

- <https://www.afdc.energy.gov/data/>
- <https://www.fueleconomy.gov>
- www.insideevs.com

APPENDIX

1. Descriptive Statistics

1.A. BEVs

Driving Ranges (mile)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	3	63	94	76,67	15,822	250,333
Y2012	7	56,00	265,00	103,2857	73,01533	5331,238
Y2013	10	38,00	265,00	94,4000	62,42364	3896,711
Y2014	12	62,00	265,00	100,3333	54,44653	2964,424
Y2015	10	68,00	270,00	101,1000	59,72613	3567,211
Y2016	12	62,00	315,00	110,4167	72,00563	5184,811
Y2017	14	58,00	335,00	129,6429	76,08053	5788,247

Battery Specific Energy (Watt-hr/kg)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	3	49	83	70,47	18,989	360,573
Y2012	7	67,00	170,00	97,4857	34,74173	1206,988
Y2013	10	54,70	170,00	92,4800	31,34410	982,453
Y2014	12	67,00	170,00	98,9750	26,85206	721,033
Y2015	10	76,20	170,00	97,4000	26,71999	713,958
Y2016	12	76,10	170,00	104,2417	27,72073	768,439
Y2017	14	88,00	170,00	118,8714	22,74211	517,204

Note: These are calculated in terms of statistics presented in Appendix B, which are available on URL: <https://www.fueleconomy.gov/feg/download.shtml>.

Recharge Time (hour)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	3	5	8	6,67	1,528	2,333
Y2012	7	4,00	12,00	7,1429	2,47848	6,143
Y2013	10	4,00	7,00	4,9750	1,15740	1,340
Y2014	12	3,50	7,00	5,0708	1,28673	1,656
Y2015	10	3,50	7,00	4,5850	1,13286	1,283
Y2016	12	3,50	7,00	5,0708	1,35554	1,837
Y2017	14	3,00	9,30	5,0250	1,62039	2,626

1.B. PHEVs

Driving Ranges (mile)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	1	35	35	35,00	.	.
Y2012	3	11,00	38,00	23,000	13,74773	189,000
Y2013	3	11,00	38,00	23,0000	13,74773	189,000
Y2014	9	11,00	72,00	26,7778	19,60725	384,444
Y2015	10	11,00	72,00	25,4000	18,99825	360,933
Y2016	14	9,00	74,00	23,9286	18,63192	347,148
Y2017	17	9,00	97,00	24,9412	21,52461	463,309

Battery Specific Energy (Watt-hr/kg)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	1	80	80	80,00	.	.
Y2012	3	59,00	110,00	83,0000	25,63201	657,000
Y2013	3	21,50	61,50	42,6667	20,10182	404,083
Y2014	9	49,00	110,00	74,9667	16,73918	280,200
Y2015	10	49,00	110,00	72,5500	17,82328	317,669
Y2016	14	54,90	100,50	75,1357	11,75255	138,122
Y2017	17	54,90	128,50	83,4588	19,58408	383,536

Recharge Time (hour)						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Y2011	1	4	4	4,00	.	.
Y2012	3	1,50	6,00	3,8333	2,25462	5,083
Y2013	3	1,50	4,00	2,6667	1,25831	1,583
Y2014	9	,67	5,00	2,8522	1,35704	1,842
Y2015	10	1,50	5,00	3,0750	1,02774	1,056
Y2016	14	1,50	5,00	2,8821	1,00644	1,013
Y2017	17	1,50	5,00	2,7647	1,02527	1,051

Notes:

1. As calculating descriptive statistics, Tesla's X and 3 models are not taken into account, since these models have similar engine properties with Tesla S and this may cause misleading means and variation records.

2. Similarly, in PHEV market, Porsche Cayenne and Panamera, Hyundai Sonata and Kia Optima are calculated as same or consecutive models. Panamera model exists from 2014 to 2016 and Cayenne from 2015 to 2017. In 2017, Cayenne is taken into account as a consecutive model for year 2017.

2. Data

2.A. BEVs

2.A.1. Driving Ranges (mile)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Tesla Model S		265	265	265	270	315	335
Tesla 3							310
Tesla Model X						289	295
Chevrolet Spark/Bolt(2017)				82	82	82	238
BYD e6				127		187	187
VW e-Golf					83	83	125
Hyundai Ioniq							124
Ford Focus EV		76	76	76	76	76	115
BMW i3 BEV/Active E(2011)	94			81	81	81	114
Nissan LEAF	73	73	75	84	84	107	107
Kia Soul EV					93	93	93
Honda Clarity							89
Mercedes B250/B-Class				87	87	87	87
Fiat 500E			87	87	87	84	84
Mitsubishi i-MiEV		62	62	62		62	59
Smart forTwo EV	63		68	68	68	68	58
Coda		88	88				
AZD Transit		56					
Toyota RAV4 EV		103	103	103			
Honda Fit EV			82	82			
Toyota SCION iQ			38				

Notes:

1. Tesla S 2016 and 2017 are AWD P100D, Tesla S 2015 is AWD 90D. Tesla S 2013 and 2014 have 85 kw-Hr Battery Pack. These are the batteries that enable the best records.

2. Chevrolet Spark exists from 2014 to 2016. In 2017, Bolt substitutes Spark; both models are midsize cars.

3. Mercedes B250 and B-Class are also consecutive models. Mercedes B-Class exists in 2014 and 2015; in following two years, the model is substituted by B-250.

2.A.2. Battery Specific Energy (Watt-hr/kg)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Nissan LEAF	82,8	82,8	87,9	87,3	87,9	87,3	102
Tesla Model S		170	170	170	170	170	170
Ford Focus EV		80,2	80,2	80,2	80,2	80,2	110
Fiat 500E			88	88	88	88	88
Coda		78,5	78,5				
AZD Transit		93,6					
Smart forTwo EV	48,6		98,9	98,9	98,9	98,9	101
VW e-Golf					76,2	76,1	104,1
Chevrolet Spark/Bolt				83	83	85	140
Mercedes B250/ B-Class Electric				125,9	98,4	125,9	125,9
Toyota RAV4 EV		110,3	110,3	110,3			
Mitsubishi i-MiEV		67	67	67		110	110
Kia Soul EV					98,4	98,4	98,4
Honda Fit EV			89,3	89,3			
Tesla Model X						150	150
Toyota SCION iQ			54,7				
BYD e6				94,8		138,1	138,1
Honda Clarity							141
Hyundai Ioniq							103,7
BMW i3 BEV/Active E	80			93	93	93	132
Tesla 3							150

2.A.3. Recharge Time at 240 volts (hour)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Nissan LEAF	7	7	4	5	5	5	6
Tesla Model S		12	4,75	4,75	4,75	4,75	4,75
Chevrolet Spark/Bolt				7	7	7	9,3
Ford Focus EV		4	4	3,6	3,6	3,6	5,5
Fiat 500E			4	4	4	4	4
Coda		6	6				
AZD Transit		8					
Smart forTwo EV	8		6	6	6	6	3
VW e-Golf					4	7	5,3
Mercedes B-Class/B250				3,5	3,5	3,5	3,5
Toyota RAV4 EV		6	6	6			
Mitsubishi i-MiEV		7	7	7		7	7
Kia Soul EV					4	4	4
Honda Fit EV			4	4			
Tesla Model X						12	12
Toyota SCION iQ			4				
BYD e6				6		5	5
Honda Clarity							4
Hyundai Ioniq							4
BMW Active E/ i3 BEV	5			4	4	4	5
Tesla 3							12

Note: Tesla's performances are choiced in terms of superior technology that enables highest driving ranges. Through using 80A dual charger option, drivers can achieve this performances as of 2013, otherwise it may take 12 hours to fill the batteries for Tesla S.

2. PHEVs

2.B.1. Driving Ranges (mile)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Chevrolet Volt PHEV	35	35	38	38	38	53	53
Toyota Prius Prime Plug-in		11	11	11	11		25
Fisker Karma		33					
Ford Fusion Energi			20	20	20	20	22
BMW i8				15	15	15	15
Cadillac ELR/Pacifica'17				37	37	37	33
Porsche Panamera/Cayenne S E-Hybrid				16	16	16	14
Honda Accord				13			
BMW X5						14	14
Mercedes S550 Plug in					14	14	14
Volvo XC90						14	14
BMW i3 REX				72	72	74	97
McLaren P1				19	19		
Audi A3 e-tron						16	16
BMW 330e						14	14
BMW 740e xDrive							14
Mercedes C350e						9	9
Mercedes GLE 550e						12	12
Hyundai Sonata/Kia Optima						27	27
Cadillac CT6							31
Porsche 918 Spyder					12		

Note: Since some models are from same segment; only one of those models are taken into account or models are recorded as consecutive models:

- Cadillac Pacifica is 2017 model minivan and is taken into account on the same line of ELR (a small size car).
- Porsche Cayenne (2015-2017) is a standard SUV and Panamera (2014-2016) is a large size model. Since they have similar engine properties, either taken on the same line.
- Kia Optima and Hyundai Sonata are both mid-size cars established under different brands (Kia is another brand of Hyundai). Kia Optima is established only in 2017 and has similar engine properties.
- Ford Fusion Energi and C-Max are either midsize cars and have same records; thus only Fusion Energi is taken into account.

2.B.2. Battery Specific Energy (Watt-hr/kg)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Chevrolet Volt PHEV	80	80	45	80	80	100,5	102
Toyota Prius Prime Plug-in		110	21,5	110	110		128,5
Fisker Karma		59					
Ford Fusion Energi / C-Max			61,5	61,5	61,5	61,5	61,5
BMW i8				71,7	71,7	71,7	71,7
Cadillac ELR/Pacifica '17				80	80	87	95,9
Porsche Panamera/Cayenne S E-Hybrid				67,1	67,1	67,1	67,1
Honda Accord				74,5			
BMW X5						80	80
Mercedes S550 Plug in					76,3	63,8	76,3
Volvo XC90						54,9	54,9
BMW i3 REX				80,9	80,9	80,9	109,4
McLaren P1				49	49		
Audi A3 e-tron						70,4	70,4
BMW 330e						86,5	92
BMW 740e xDrive							92
Mercedes C350e						76,3	63,8
Mercedes GLE 550e						76,3	76,3
Hyundai Sonata/Kia Optima						75	75
Cadillac CT6							102
Porsche 918 Spyder					49		

2.B.3. Recharge Time at 240 volts (hour)

Models / Years	2011	2012	2013	2014	2015	2016	2017
Chevrolet Volt PHEV	4	4	4	4	4	4,5	4,5
Toyota Prius Prime Plug-in		1,5	1,5	1,5	1,5		2
Fisker Karma		6					
Ford Fusion Energi			2,5	2,5	2,5	2,5	2,5
BMW i8				2	2	2	2
Cadillac ELR/Pacifica '17				5	5	5	2
Porsche Panamera S E-Hybrid/Cayenne'17				3	3	3	3
Honda Accord				0,67			
BMW X5						3	3
Mercedes S550 Plug in					2,75	2,75	1,9
Volvo XC90						3	3
BMW i3 REX				4	4	4	5
McLaren P1				3	3		
Audi A3 e-tron						2,5	2,5
BMW 330e						2	2
BMW 740e xDrive							3
Mercedes C350e						1,5	1,5
Mercedes GLE 550e						1,9	1,9
Hyundai Sonata/Kia Optima						2,7	2,7
Cadillac CT6							4,5
Porsche 918 Spyder					3		

3. Sales in the EV Market

U.S. Electric Vehicle Sales by Model								
	Type	2011	2012	2013	2014	2015	2016	2017
Nissan LEAF	EV	9,674	9,819	22,610	30,200	17,269	14,006	103,578
Tesla Model S	EV	0	2,171	19,000	16,750	26,200	29,156	93,277
BMW i3	EV	0	0	0	6,092	11,004	7,625	24,721
Ford Focus EV	EV	0	683	1,738	1,964	1,582	872	6,839
Fiat 500E	EV	0	0	260	1,503	4,569	3,897	10,229
Smart for Two EV	EV	0	137	923	2,594	1,387	657	5,698
VW e-Golf	EV	0	0	0	357	4,232	0	4,589
Chevrolet Spark /Bolt	EV	0	0	560	1,145	2,629	3,035	7,369
Mercedes B-Class Electric/B250	EV	0	0	0	774	1,906	632	3,312
Toyota RAV4 EV	EV	0	192	1,005	1,184	18	NA	2,399
Mitsubishi i-MiEV	EV	76	588	1,029	196	115	94	2,098
Kia Soul EV	EV	0	0	0	250	1,015	1,728	2,993
Honda Fit EV	EV	0	93	569	407	2	NA	1,071
BMW Active E	EV	0	965	0	0	0	0	965
Tesla Model X	EV	0	0	0	0	208	18,028	18,236
Hyundai Ioniq	EV	0	0	0	0	0	0	432
Honda Clarity	EV	0	0	0	0	0	0	1,121
Chevrolet Volt PHEV	PHEV	7,671	23,461	23,094	18,805	15,393	24,739	113,163
Toyota Prius Prime Plug-in	PHEV	0	12,749	12,088	13,264	4,191	2,474	44,766
Ford Fusion Energi	PHEV	0	0	6,089	11,550	9,750	15,938	43,327
Ford C-MAX Energi PHEV	PHEV	0	2,374	7,154	8,433	7,591	7,957	33,509
BMW i8	PHEV	0	0	0	555	2,265	1,594	4,414
Cadillac ELR	PHEV	0	0	6	1,310	1,024	534	2,874
Porsche Panamera S E-Hybrid	PHEV	0	0	51	879	407	393	1,730
Porsche Cayenne S E-Hybrid	PHEV	0	0	0	112	1,163	2,111	3,386
Honda Accord	PHEV	0	0	526	449	63	NA	1,038
BMW X5	PHEV	0	0	0	0	892	5,995	6,887
Smart ED	PHEV	310	2	0	0	0	NA	312
Mercedes S550 Plug in	PHEV	0	0	0	0	118	550	668
Volvo XC90	PHEV	0	0	0	0	86	2,020	2,106
Chrysler Pacifica	PHEV	0		0	0	0	0	4,597
Audi A3 e-tron	PHEV	0	0	0	0	0	4,280	2,877
BMW 330e	PHEV	0	0	0	0	0	870	4,141
BMW 740 xDrive	PHEV	0	0	0	0	0	0	707
Mercedes C350e	PHEV		0	0		0	171	817
Mercedes GLE 550e	PHEV	0		0	0	0	231	463
Hyundai Sonata	PHEV	0	0		0	0	3,095	2,535
Kia Optima	PHEV	0	0	0	0		0	1,512
Cadillac Ct 6	PHEV	0		0	0	0	0	207
Porsche Spyder	PHEV	0	0	0	0	203	0	0

Note: Data from 2011 to 2016 is taken from [Afdc.energy.gov](http://afdc.energy.gov). Data for 2017 and brands marked with yellow are taken from [Insideevs.com](http://insideevs.com).