A historical Path Dependence:
The development case of eco-friendly vehicles
(abstract)

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Abstract

If technological innovations are one of the major historical movers of economic growth, how exactly are technological choices made? A technological choice is taken whenever a new technology is preferred over others, and firms have to come to a decision whether to develop it or not. Generally, technological decisions are being made in response to the contextual perceived threats or potential future opportunities. The contribution extent of a company’s strategy on success with a technology may be changed by political and other social forces, and may also interact with company’s own capabilities. Although technological decisions exhibit a similar form of disciplines, but in nature they lack a unified overall paradigm. Although technological choices have been classified based on their disciplinary background, this study will discuss that even in a presumed chosen industry, they are still different in nature.

Using the Path Dependence Concept and Resource Based Theory of Competitive Advantage, this study tries to explore the technological choice process in the companies. Resource Based Theory views the resource accumulation as a positive way to increase the firm’s competitiveness, while Path Dependence claims that the company’s historical asset may cause it to get trapped in an inferior standard or technology. In this regard, using an inside-out approach and considering the firm’s technological trend over time, this thesis will identify the limitations of the Resource Based View.

A case study of four major Japanese eco-friendly vehicle manufacturers was adopted to better understand the nature of technological decision making in firms. Despite recent studies in eco-friendly vehicles development and their social acceptance, understanding the technological aspect still falls significantly short of achieving satisfying results. Examining the recent development history shows that “Toyota and Honda chose hybrid technology as their main electrification program, while Nissan and Mitsubishi later chose to develop EVs”. In this sense, this thesis aims to scrutinize the motives and influencing factors behind the technological choice of Japanese car companies toward the development of eco-friendly vehicles.

In addition to the case study, historical patent data from 1980 to 2012 is statistically analyzed to find out more about the car companies’ eco-friendly R&D investments. This will help to unveil whether the real issue could be “Path Dependency and Lock-in to the previous technological experiences” or “A mere strategic choice in response to social forces”.

The findings demonstrate that for each manufacturer, electrification as a technological choice is a unique process and each company has a different set of strategic and technological factors which could have influenced them through time. Besides, the technological choices of companies are shaped by social forces, market trend and the companies’ competitive strategies, while the importance of historical capabilities and previous technological assets shouldn’t be ignored. The findings shed light on the previous technological studies, while emphasizing on the importance of strategy in the eco-friendly market.