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Electric Vehicles Production in Turkish Automotive Industry and Sectoral PEST Analysis

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Abstract

In general, the manufacturing automotive firms in global markets cooperate with the firms in Turkey in the fields of production and marketing. Within this type of cooperation, capacity increase has been achieved in Turkish automotive sector and new model investments have been made. In other words, global automotive firms' technology and research and development potentials are being extensively used by the automotive industry in Turkey. To this end, the Turkish automotive firms strongly rely on the Electric Vehicle (EV) production methods used in international markets. Domestically, the first EV was marketed by Renault in 2012. The local and central Turkish governments and administrations show essential interest to the automotive industry and offer extensive incentives for the domestic manufacturers. The domestic manufacturers essential demands are investments should be increased and the barriers before the manufacturers should be removed to ensure that the Turkish automotive sector becomes more successful in the production of EVs. For this reason, a number of projects have been implemented. In this study, PEST analysis has been run on the EV production to evaluate the performance of the Turkish automotive industry.

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1. Introduction

Like any other industry-intensive sectors, the automotive sector production in the current global economy becomes attractive in the developing countries because of a number of reasons including

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environmental regulations, low tax rates and lower labor costs, as well as other advantages. For the firms, the competition becomes extremely bitter in the domestic and global markets. The manufacturers focus to maximize their profits; therefore, seek to preserve their competitiveness by increasing efficiency and reducing the production costs. In general, the merger of the automotive manufacturing firms that seek to attain competitiveness due to the ongoing global competition in the world led to the reduction of the firms in the market by two-third. The growing expectations of the consumers increase the production costs of the firms. The increases in R&D expenses, the increased costs and risks associated with the supply surplus, and the failure of the market to grow further, as well as the rising expectations of the consumers and the growing competition between the firms could be cited as the primary reasons for these mergers.

The EVs have become major source of discussion due to its rising popularity in connection with the oil crises experienced since early 19th century (Ustaoglu & Yıldız, 2012). Due to recent fluctuations in oil and energy prices and search for alternative solutions by the producers and the consumers, the EVs have become popular again.

Turkish automotive industry, after construction and tourism sectors, is the sector that contributes most to the national economy. The industry creates additional sectors and industries including steel and iron, petro-chemical materials, rubber, motor vehicle supply and advertising as well as marketing and service. In other words, the changes in the automotive sector are extremely important for the domestic economy. The leading automotive manufacturers in the world focus on the several production options. Turkey's foreign trade mostly relies on automotive products.

EV is one of the most innovative technologies and for this reason, it attracts growing attention in the industry. A number of projects have been implemented to promote use of the EVs. PEST analysis seeks to review political, economic, social and technological factors, to identify the periodical expectations in the future and to determine who are affected by these factors. In this study, PEST analysis has been run for the incentive program and projects implemented by the manufacturing firms, central and local administrations.

2. Literature Review

2.1. Innovation Economics and Innovative Products in Markets

Innovation is extremely important for many industries. A large body of empirical studies focused on technological progress and innovation of firms. The modern theories of innovation upon economic growth were inspired by Schumpeter's works in early 20th century (Karaöz & Albeni, 2003). Schumpeter formulated innovation in all kinds of profit-making motives and activities based on technological advances in all thinking and things (Schumpeter, 1942; Wong, Ho, & Autio, 2005). According to Fisher, innovation is one or all parts new thinking: new ways of doing things to produce and test related economic and social activities (Maiwald, 1998). Schumpeter's work (1942) predicted that the innovative activities of the entrepreneurs feed a 'creative destruction' process. Economic growth is a process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, and incessantly creating a new one (Schumpeter, 1942). As envisaged by Schumpeter, the EVs are not expected to replace the internal combustion engines (ICE) vehicles in the near future. The corporations that disregard innovation during production process, transportation, etc. will be eliminated from markets and become remnants of the past. Theory states that the natural increase of entrepreneurs will accelerate economic growth. The recent theoretical studies done by Solow (1956) and Romer (1986), and the empirical accounts by Mansfield (1972) and Nadiri (1993) related technological innovation to economic growth. These theories have been well established in economic literature (Wong, Ho, & Autio, 2005; Solow, 1956; Romer, 1986; Mansfield, 1972; Nadiri, 1993). These studies have established that the level of the technological innovation of a company contributed to its economic performance and increasing market share (Wong, Ho, & Autio, 2005). Nadiri (1993) applied the Cobb-

Douglas production function and related innovation to final output and productivity (Nadiri, 1993) . In the long-run, growth, output, and a firm's performance depend on the growth rate of inventions (Wong, Ho, & Autio, 2005).

Many countries in the world, including developed and developing ones, have started to implement new policies for innovative technologies. The sustainable innovations could play an important role for the economic and technological development of transportation and automotive markets (Walz, 2011). Lately, in the United States, the Obama administration has set a goal of one million plug-in vehicles on the road by 2015 and has introduced laws and policies supporting this goal (Hidrué, Parsons, Kempton, & Gardner, 2010). Turkey is one developing country whose government has tried to implement similar policies across the country as well. In 2011, the government passed a regulation for the registration of EVs. Additionally, some car manufacturers in Turkey are planning to introduce new EV models to the domestic market in 2012. Turkey's Ministry of Industry and Trade has been studying the trend towards electric and hybrid-powered vehicles and aims to make the country a leading EV manufacturer. Incentives will be granted by the government for EV manufacturers and investments will be made in R&D (Deloitte, 2010). Charging stations will be introduced, while agreements and special arrangements will be made with electric distributors and oil stations.

2.2. Turkish Automotive Industry

The automotive industry is one of the most important dynamics behind the bold performance in the exports owing to the transformation in the 2000s. For Turkey's case, the role of the Custom Union (CU) with EU signed on 1996 has played visible important role in the transformation of the automotive industry. The innovation and dynamism introduced by the CU to the sector ensured the modernization of the sector and use of innovative production methods (Bekmez & Komut, 2006) . Because of the increase in the amount of foreign direct investment (FDI) in the sector, a number of automotive producers, in an effort to exploit the advantages associated with the CU agreement between Turkey and the EU, established production facilities in Turkey and become more competitive in the global markets (Fındıkçioğlu & Yıldırım, 2010). The sector is susceptible to the economic crisis because the elasticity of demand is pretty high in the domestic market; and this is the major factor that prevents the healthy growth of the sector. The stability in the demand in the domestic market may also negatively affect the production. It has been observed that up to 2000s, the political instability has negatively affected the automotive sector. The stagnation and recessions in the domestic markets led the producers to postpone their investments in the research and development and new models; and this influences the competitiveness of the sector. Turkish automotive sector consummated 2010, a glittering year for the Turkish automotive industry, with 1,094,557 units of production (excluding tractors), which points to 26% annual growth. Capacity utilization ratio (CUR) materialized as 72% as of year-end 2010, which is 15 percentage points higher than 2009's CUR (Fındıkçioğlu & Yıldırım, 2010). 19.7 pct of the the imports of automotive and automotive-related products by the EU is made from Turkey whereas the share of exports to Turkey in the same category is 7.5 pct (DGTrade Statistics, 2011; DGTrade Statistics, 2012).

3. Methodology and Data Collection

3.1. Research Goal

The purpose of this study is to review the impact of the growing energy costs in connection with the fluctuations in the oil prices in recent years upon the demand for the EVs in domestic market and to run a PEST analysis of the EV production in Turkey.

3.2. Sample Data Collection

The statistical data used was collected mainly through internet sources from the Turkish governments' official statistical webpages TurkStat (Basic indicators by sections in industry and service sectors), Turkish Automotive Manufacturers Associations (Total automotive production statistics 1999:2010, Turkish automotive industry total export, total import and foreign trade balance); The International Organization of Motor Vehicle Manufacturers (Worldwide automotive production statistics) ; EU Bilateral Trade and Trade with the World: Turkey (Main Economic Indicators) (OSD, 2011; Deloitte, 2010; Sanayi Genel Müdürlüğü, 2011; TurkStat 2011).

4. PEST Analysis of EVs Production in Turkey

PEST Analysis is an analysis run based on the review of political, economic, social and technological factors relevant to the discussion to determine the future expectations and to identify the positive and negative impacts of these factors. In current global economy, automotive production is moving from the developed economies to developing economies. The primary goal in this move is to become more competitive by lower-cost production and to attain their goals in the global markets by expanding the sphere of markets. However, number of producer firms in the global markets has been reduced by two-third. This decline is seen in form of merger of the corporations. The increases in the R&D expenditures, the cost increases associated with the supply surplus and the accompanying risks, the inability of the market size to increase in line with the supply, the consumer expectations of high quality, and the intense competition between the producing firms may be cited as the main reasons for these mergers. After construction and tourism sectors, Turkish automotive industry is the third sector that creates the highest rate of multiplier. The Turkish automotive industry is pretty important because of the sizeable business in different sectors including advertising, marketing, service, fuel, finance and insurance because of the relevance of this sector to those industries. In other words, the changes in automotive sector is crucial for the Turkish economy.

The producer automotive firms in the global markets cooperate with the Turkish firms in the fields of production and marketing. Within this setting, a capacity increase was secured in Turkish automotive sector and for economic competition, technological innovation and new model investments have been made in transition to new economy. In other words, the technology and R&D potentials of the global automotive firms are best used by the Turkish automotive actors. To this end, in the production of the electrical motor vehicles, the methods and technologies that are popular in the main producers in the world are used in the Turkish automotive industry. To ensure that the Turkish automotive sector keeps improving in this field, the investments should be encouraged in this field and the problems should be properly addressed. For this purpose, a PEST analysis was performed in respect to the production of the electrical motor vehicles in Turkish automotive sector. The main headings of this analysis are as follows.

4.1 Political and legal factors

The sales taxes of motor vehicles in Turkey include value added tax(VAT) and exclusive consumer tax. The sales taxes are pretty high in Turkey when compared to the tax rates in developed countries. For instance, the current VAT rate is 18 pct in average (Deloitte, 2010). The rates of exclusive consumption tax, depending on the type of the vehicle, vary between 1 and 84 pct. In other words, the total share of the sales taxes of the motor vehicles ranges between 19.2 pct and 117.1 pct. Legislation on motor vehicle is frequently amended because of frequent changes in technology (OSD, 2011). After such amendments, domestic demand declines. The decline in the demand directly affects the production. This makes the

investment decisions more unlikely; and as a result, the investors may change their minds and postpone the implementation of their decision for investment. Because of the shortcomings in the legislation on the production, sale and recharge of the electrical motor vehicles in the Turkish automotive sector, the situation referred to above poses serious problems for the electrical motor vehicles. Particularly for the R&D expenditures in regards to the production of the electrical motor vehicles, tax incentive system should be implemented by the state. The amount of the sales tax applicable to the electrical motor vehicles should be reduced; and in consideration of its environment-friendly design, the tax rate should be more reasonable for these vehicles. Considering that the national income per capita and the individual car per head is below the world average, the legislation and infrastructure in regards to the electrical motor vehicle should be made by the state in form of autonomous expenditures. These expenditures will be reflected in the Turkish economy as the contribution of the EVs in form of induced investments after a few short terms.

4.2 Economic factors

The automotive sector is one of the fields that attract greatest amount of investment in global economy. Therefore, it provides high amount of tax revenues to the national economies makes huge amount of profits and offers attractive opportunities of employment. The Turkish automotive producers establish partnerships with the global giants which lead to construction of vast facilities of production. Thanks to this partnership, the Turkish automotive players make revenues out of advanced technology used in the production. The most important reason for this is that Turkey is a suitable place in terms of social and economic as well as geographical aspects for automobile production. As a result, the number of models produced in Turkey increases every year. As a result of the integration of automotive and other sectors with global economy, the specialization in production and marketing, the improved quality and productivity in production have played significant roles in the production of electrical motor vehicles in Turkey. To this end, to ensure sustainable competition in the production of the electrical motor vehicles, there should be greater amount of spending for R&D, design and technology. Turkish economy has this capacity and background to do this. Inflation rate has been on decline in recent years in Turkey; and the economy has grown faster than other countries in the world. Car loans become attractive because of the lower cost of bank loans. The banking sector, therefore, is now able to provide funds to buyers and sellers at the same time. One of the factors that determine the decisions of the automobile producers to make investment in a particular country is the labor cost. The labor cost is relatively attractive in Turkey when compared to many advanced and developed countries; however, it is not cheaper than the labor cost in Central European countries, Russia, India and China. Despite this, Turkey still remains attractive to the automobile producers because of its expertise in production and marketing, as well as high quality and productivity. The best example of this is the production of electrical motor vehicles. The problems in labor cost particularly stem from the high tax rate of the labor supply and social security cuts.

4.3 Social and Cultural Factors

One of the reasons for the growing interest in the electrical motor vehicles is the fact that they are environmental-friendly. The most visible aspect of these vehicles is that they do not emit poisonous gas to the air. In other words, the electrical motor vehicles do not serve as the source of external cost. To make sure that the consumers prefer these environment friendly vehicles, the necessary steps should be taken for the installation of recharging stations. Particularly in the urban cities, a number of agreements have been made with the local administrations to create the necessary infrastructure. When this infrastructure is built, the consumers will start to file demands for these vehicles as long as they become convinced that the EVs fulfil their needs and desires. The Turkish automotive sector players are focused on the taxi owners and public transportation authorities as their potential customers for the EVs until the

completion of the process of infrastructure and groundwork. In other words, it seems that the real and legal persons active in trade and commerce as well as the public sector will serve as the main source of domestic demand for the EVs for some time.

4.4 Technological factors

The EVs are new products in the automotive sector for the markets. In terms of usage of the renewable energy resources, the EVs allow usage of the energy resources most effectively and efficiently. Compared to other vehicles, EVs hold an ecological supremacy. In the long run, the multiplier effect in general economy via ecological supremacy will ensure improved quality and productivity in the agricultural products and reduction in the health expenditures. Considering that the fields of organic cultivation should be at least 5 km away from emission of hazardous gases, this issue becomes more relevant and important. The public sector should allocate greater amount of investments for infrastructure and introduce programs of incentive for improvements in this field.

Conclusion

Economic competitiveness and environmental issues have become more relevant and important in global markets. The main factor ensuring that the economic competitiveness and environmental issues become relevant for the markets is the emergence of a new economic approach and understanding. New economy ensures most effective use of the economic resources, knowledge and technology.

The reason that the EVs have become popular in global markets is the emergence of the concept of new economy. The EVs will become even more important within the markets because of their ecological impacts and low cost benefits. As this process becomes more relevant, the EVs will be recognized as part of a more sustainable and competitive approach and as a great opportunity for the developing economies. This was appreciated in Turkey as a great opportunity; and as a result, production of EVs for the domestic and international markets has started.

The most important and crucial issue in the production and usage of the EVs in Turkey is lack of necessarily legal background. The second most important issue is the high tax rate as recognized in the relevant legislation and the diverse types of the taxes applicable to the motor vehicles. The third issue is lack of technological background for the recharging of the EVs. These issues negatively affect the potential demand and the views and decisions of the consumers on the EVs. This represents the greatest obstacle before the growth of the demand for the EVs in Turkey and in the world.

In response to these issues, the producers have developed new marketing and sale strategies for Turkey. Up until the issues referred to above are resolved, they have identified the owners of commercial vehicles and public vehicles as the main targets. At the same time, they are also trying to expand their market share abroad.

While performing these activities, the producers also rely on a discourse to promote the environmental friendly vehicles in their advertising and marketing endeavours; they also draft their new policies to reduce their costs. However, it should be noted that the EVs will be preferred in Turkey for economic reasons and for the lower cost associated with its usage. It cannot be said that the consumers properly recognize the ecological considerations. For this reason, further studies and attempts should be made to raise environmental awareness among the people. Such studies could be performed in cooperation and collaboration between the universities, industry and the public sector.

Turkish automotive industry should be extremely competitive in order to become a center of production of the EVs and serve as a key actor in the global markets. It should make exports to developing markets and should have competitive advantage. Turkish automotive industry should also have resources for further employment and R&D studies and activities. It seems that the Turkish automotive industry has the potential to make huge progress in production and consumption of the EVs in the coming five years.

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