

Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

Student:	Adéla Pavelková
Advisor:	Doc. PhDr. Julie Chytilová, Ph.D.
Title of the thesis:	The Impact of Electric Vehicles on the Automobile Industry

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Please provide your assessment of each of the following four categories, summary and suggested questions for the discussion. The minimum length of the report is 300 words.

Contribution

The author provides analysis on the present state and the future of electric vehicles and their impact on the automotive industry. In particular, the author focuses on the potential development of electric vehicle (EV) sales as a portion of overall car sales, presents estimates on the impact of energy prices (gasoline, electricity) on EV sales, and analyzes price cross elasticity between non-electric vehicle price and EV sales. The main contribution of the thesis lies in the analysis of the new and developing electric vehicles market for which there is a large potential for research. In addition, the thesis discusses and attempts to verify forecasts made in existing analyses on the EV market development.

Methods

The thesis applies trend analysis and Bass diffusion model to model future EV sales while correlation analysis and linear regression are used to estimate relationship between energy, non-electric vehicle prices and EV prices, and cross elasticity between EV sales and non-electric vehicles price, respectively. The approach undertaken in the thesis to analyze the young and developing market for EVs is appropriately varied but is very assumption-dependent. The author, however, fails to explain assumptions beyond the Bass diffusion model to project EV sales, especially with respect to parameters of the model, which were extracted from existing literature. In particular, discussion of appropriateness of these parameters for the analysis at hand is missing. Moreover, any explanation on how, why and if at all these parameters could differ in application of the model to different countries/regions is non-existent as well. Similarly, to convince the reader about suitability of the Bass diffusion model the author should have elaborated on success/failure of the model to project penetration of other innovations (e.g. color television) when evaluated in retrospect.

More importantly, the thesis lacks a proper presentation of the data used in the analysis, e.g. reporting their descriptive statistics, transformations, sources as well as start and end of the sample.

From the text, it appears that the collected data is in monthly frequency. Nevertheless, trend analysis and the Bass diffusion approach is evaluated on an annual basis. Was the data aggregated for this analysis, if so was the data summed over each month in a year? What is the sample size on an annual basis for calculating trends from the data and sales projections from the Bass model?

As for correlation analysis, the author calculates two types of correlation coefficients (Spearman's and Pearson) depending on normality of the data distribution and reports their magnitudes. It is not, however, reported what the statistical significance of the estimated correlation coefficients is. In addition, the author performs correlation analysis on differences/growth rates of car sales and energy prices. It is not, however, clear if the author has tested for the presence of a unit root in the data prior to the analysis in a formal way (e.g. Dickey-Fuller test) since differencing the data does not always ensure stationarity.

Last, the author performs correlation analysis between energy prices and EV sales and elasticity calculation only for the US data since global statistics are not available. Why does not the author perform this analysis also for other large regions (China, Europe) to make it consistent with the descriptive part of the thesis that deals with individual markets?

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Literature

The author uses a wide range of literature and other online resources to adequately support the analysis undertaken in the thesis. As the research on EV market development is relatively new the majority of the literature consists of online sources and reports as opposed to books or scholarly articles. All in all, the author properly uses existing resources in her thesis.

Manuscript form

The thesis applies a citation style that makes use of numbers in brackets (Institute for Electrical and Electronics Engineers citation style) instead of author name/institution and publication year that is commonly used in Economics. Regardless, the citation style is not properly used since it is not organized numerically but alphabetically.

As for the language, the thesis reads easily but repetitive grammar errors are commonplace throughout the text (e.g. on Europe, automobile industry instead of automotive, etc.). Similarly, there is no numbering of equations throughout the thesis.

Some of the figures in the descriptive part of the thesis detailing recent developments in the EV market in individual regions could be more harmonized. For example, Figure 4.5 depicts share of EVs versus non-electric vehicles while other figures in this chapter illustrate share of pure EVs versus hybrid electric vehicles. For the US, for instance, the number of EVs in the car fleet is reported per year with no figure showing their relative share in percentages.

Summary and suggested questions for the discussion during the defense

Overall, the thesis analyzes recent developments and makes projections in EV market globally and in selected regions/countries. The topic is well introduced, factors with potential to influence the market in the future are adequately discussed and anchored in the literature. Nevertheless, the thesis suffers from several shortcomings mainly in the methodological part and from some issues as to its form. For the discussion during the defense I recommend the author addresses the issues I raised in the Methods part of this report. All in all, I recommend the thesis for defense with suggested grade C.

SUMMARY OF POINTS AWARDED (for details, see below):

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	30
<i>Methods</i> (max. 30 points)	15
<i>Literature</i> (max. 20 points)	20
<i>Manuscript Form</i> (max. 20 points)	10
TOTAL POINTS (max. 100 points)	75
GRADE (A – B – C – D – E – F)	C

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NAME OF THE REFEREE: *Mgr. Diana Žigraiová*

DATE OF EVALUATION: *May 31, 2018*



Referee Signature