

Report on Bachelor Thesis

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

Student:	Jonáš Čekal
Advisor:	Petr Pleticha, M.Sc.
Title of the thesis:	How effective are subsidies for electric vehicles? An evaluation of Czech policy

OVERALL ASSESSMENT

Short summary

Thesis by Jonáš Čekal aims at the effect of investment subsidy provided to purchases of passenger electric vehicles (EV) in the Czech Republic on the new vehicle registrations. It uses annual and monthly data on vehicle registrations and other controls for relatively short period of 2015-2021. Vehicle markets in three Baltic states (Estonia, Latvia, Lithuania) and Poland serve as a control group. The result is not clear, not suggesting a clear link between the EV registrations and the provided subsidies to them.

Contribution

This thesis contributes to the literature analysing the drivers of adoption EVs, relying on aggregated panel data. This analysis is performed in a country in that such analysis has not been performed yet. This research is very policy-relevant and useful.

The analysis relies on the DiD approach, with the first-difference estimator as a robustness check, that I appreciate. I also appreciate augmented model with other covariates, since decision to buy a EV is affected by many factors.

Methods

The effect of incentives on EV registrations is analysed through the DiD estimation of population average treatment effect (ATE), using monthly and annual data, analysing the effect (separately) on EV market share and the number of EV registrations. Model in the first-differences is estimated, as a robustness check, especially to response of violated stationarity assumption in the monthly data covering the whole period.

I think there are several issues in the performed analysis.

First, according to the descriptive statistics, investment support was provided during 68 ($0.162 \cdot 420$) out of 84 months, i.e. 81% of months, in the Czech Republic. Moreover I worry that incentives were provided in later years of the analysed period when also other factors played role (such as increased GDP, more EV make and models appearing in the market, more dense penetration of charging stations, widely spread knowledge about EVs worldwide, etc.). Defining the treatment as a dummy, even for controlling country- and time-specific FE, I worry one can't get any reasonable estimate of such defined „treatment“. This might potentially explain why some estimates are implausible (not significant) as it is the case of the model with EV market share as the dependent variable or inconsistent estimates for EV registrations for the DiD with the non-stationary monthly data (positive weakly significant) and for the model with the first-differences (strongly significant but with negative sign)

Second, mean of dummy identifying month when an incentive was provided in foreign countries, understand in the control group, is 0.15, indicating that 63 ($420 \cdot 0.15$) out of (12x7x4) times, that is in 18.8% cases some incentive was implemented in the control group. Specifying dummy treatment for such data, one is analysing the difference in EV registrations in the Czech Republic with incentives compared to the control that also received for some period an incentive. I find this is not properly defined control group.

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In my opinion, both these potential flaws might be treated with treatment intensity, that is, defining treatment is amount of money allocated to a public program subsidizing purchase of EVs.

Interpretation of the treatment coefficient with the dependent variable defined as EV market share might be tricky, since market share is a ratio of variable of the interest (EV registrations) and total number of registered vehicles in given period (month). So even if the effect of incentive on the number of EV registration was positive, the effect on market share can be negative if total vehicle market was rapidly increased.

Literature

Reviewed literature is relevant to the topic and it includes the key literature in the field. I appreciate author's summary of public programs subsidizing electric vehicles in the Czech Republic. Bibliographic information is not properly provided in Reference list (e.g., Tlaskalova 2021).

Manuscript form

This thesis follows standard, logical structure. The text refers to tables and disposes with a complete bibliography. The thesis is written in competent English and typeset in LaTeX.

Overall evaluation and suggested questions for the discussion during the defense

This bachelor thesis is written in high standard (even if it was a master thesis). However there are some issues requiring some justification during the state exam.

I find this thesis corresponding academic standards for bachelor theses written at the Institute. The results of the Urkund analysis do not indicate significant text similarity with other available sources.

In my view, the thesis fulfills the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University, **I recommend it for the defense** and suggest a **grade B**.

I really appreciate your work, it is not easy, trivial, task.

Question for defense:

1] Justify your approach regarding your definition of a control group (four countries which also provided incentives to EVs) and the fact that the incentive was provided in the Czech republic for most of the analysed period (see above). Why you did not estimate treatment intensity effect?

2] Discuss and interpret different estimation results you got from the DiD model and the first-difference approach, specifically the results presented in Table 6.5 and 6.6. Also interpret in detail the differences in the estimates of the coefficient for „Czech_incentive_dummy“ for model (1: all data) and (2: data 2015-2019) in Table 6.5.

3] Clarify your time-specific FE. Are these FE defined around year, year and month, or year-month? Interpret the results for these three specifications of the time-specific FE.

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4] Justify your claim at page 16: „...nationwide supplementary incentives will be neglected in our models' specifications as we consider them to hardly influence EV registrations“. I disagree with your statement. I believe what matters is not whether an incentive is nationwide or specifically targeted, but whether incentive is sufficiently large to motivate agents to change their behavior. I agree you might have an issue in a model using nationwide data to estimate anything. Discuss this point.

5] How would you interpret positive coefficient of the treatment variable on EV market share? Could you conclude that positive significant coefficient indicates positive effect on EV registrations? I would not say so.

6] Why foreign_incentive_dummy is omitted from model in Table 6.5, with the data 2015-2019? It is because all incentives provided in the foreign countries (control group) were provided after 2019, meaning there was no incentive provided during 2015-2019?

7] Why did you choose three Baltic states and Poland as a control group? Why you did not choose Slovakia which vehicle market is very similar to the Czech one and for that vehicle registry data are easily available?

Less important questions:

8] Did market on battery electric vehicles react on the incentives differently than PHEV market? Did you analyse the effect on the two different vehicle segments separately?

9] I would appreciate to see the plot to check common trend. If required, please, report and discuss it with the committee members.

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

CATEGORY	POINTS
<i>Contribution (max. 30 points)</i>	27
<i>Methods (max. 30 points)</i>	23
<i>Literature (max. 20 points)</i>	20
<i>Manuscript Form (max. 20 points)</i>	20
TOTAL POINTS (max. 100 points)	90
GRADE (A – B – C – D – E – F)	B+

NAME OF THE REFEREE: *Milan Ščasný*

DATE OF EVALUATION: *September 2, 2022*

Referee Signature

