

# **Socioeconomic Determinants of Electric Vehicle Adoption in Czechia**

**Jindra Lacko**  
**KEKO VŠE**

# Introduction

- Replacing ICE vehicles by EVs is a key part in most CO<sub>2</sub> emissions reduction plans
- Understanding, and proactively managing, EV adoption has policy implications
- Spatial Econometrics is well positioned to provide such understanding

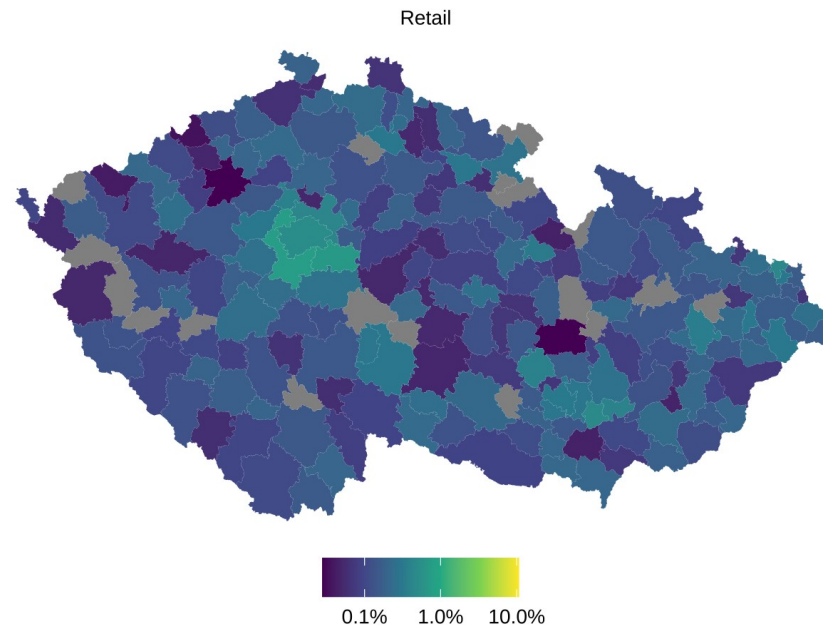
# Data & Methods

- Vehicle registration data (n = 1 451 075) from MDČR were evaluated at ORP level (n = 206)
- Socioeconomic variables (n = 37) from 2010 census considered as possible predictors
- Variable selection via stepwise regression technique, utilizing BIC selection criterion
- Moran's  $I$  for measuring spatial (auto)correlation

$$I = \frac{n \times \sum_{i=1}^n \sum_{j=1}^n w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{S_0 \times \sum_{i=1}^n (x_i - \bar{x})^2}$$

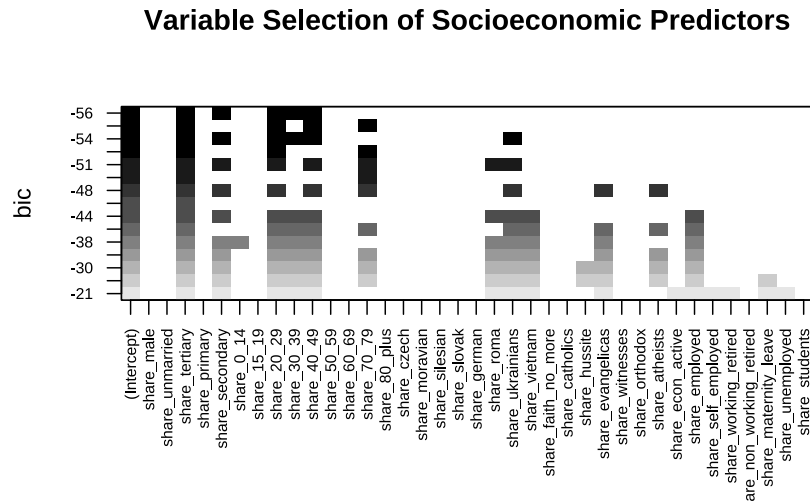
# Results I

- EV adoption is strongly concentrated, unlikely to be result of a random process
- Prague and suburbs visually stand out (+ Brno & Ostrava)



# Results II

- Stepwise regression technique via R package `{leaps}` identified 5 significant (out of 37) predictors (+ intercept)
- Spatial distribution of residuals after regression can be considered random



# Results III

- 2 predictor variables relate to education
- 3 predictor variables relate to age
- All 5 are known to be related to personal income (not included in census dataset directly)

Predictor	Estimate
(Intercept)	-0.0026054
share_tertiary	0.0231545
share_secondary	-0.0111015
share_20_29	-0.0346547
share_30_39	0.0218416
share_40_49	0.0428472

# Conclusion

- Our model of 5 predictors is highly significant, with F statistic 21.39792 and  $R^2$  0.3485121
- The model resolved the initially strong spatial autocorrelation (important OLS assumption)
- Possible unifying theme of the 5 predictors is personal income as a driver of EV adoption
- More research is needed, using more data