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in Katowice



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Excellence in Transition of Coal
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FINAL RESEARCH REPORT

TITLE OF THE PROJECT

*Impact of the macroeconomic factors on the level of energy poverty-case of
the Czech Republic, Poland, and Slovakia*

TEAM

Iwonfa Franczak¹, Bartłomiej Lisicki¹, Prity Sinha², Luo Yang³

1. *University of Economics in Katowice, Faculty of Finance, Department of Accounting, Poland*
2. *VSB Ostrava, Faculty of Economics, Department of Economics, Czech Republic*
3. *VSB Ostrava, Faculty of Economics, Department of Finance, Czech Republic*

Project supervised by:

Leaders: prof. Monika Wiczorek-Kosmala & prof. Jozef Glova

Mentors: prof. Cristina Florio, prof. Francesca Rossignoli



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Development of project proposal

The project was developed during Hackathon. During this event has been created the first draft of an extended abstract of the scientific paper under the supervision of the team leaders. The main topic of it was the problem of energy poverty.

Energy poverty is not only a topic related to the natural resources extraction sustainability problem but also human activities, especially vulnerable consumers. Although energy poverty affects many different economic sectors, its most relevant (and perhaps least known) repercussion is its impact on household living and behaviors. There is no standard definition and criteria of energy poverty. Energy poverty usually can be explained as a situation in which households are unable to access essential energy services such as co-legislators, adequate warmth, cooling, lighting, and energy to power appliances and products.

After the event, it was decided that two sub-teams would be distinguished within the team. The first one was to deal with the impact of macroeconomic factors on the level of energy poverty (3A). The second one, in turn, addressed the issue of energy poverty from the point of view of consumers' expenses (3B).

The presentation during Hackaton - appendix no 1

Further presentations of the project:

(1) University of Southampton study visit - appendix 2

During the event at the University of Southampton, the paths chosen by the distinguished components were presented. The chosen research procedure and the assumptions and objectives adopted in the research were presented. These elements collectively provided a foundational framework for the forthcoming research project, ensuring clarity and direction for its subsequent stages.

(2) University of Bari / 10th European Risk Conference Conference - appendix 3

The improved research proposal, has been presented at the 10th European Risk Conference held at the University of Bari in Italy. Participants in sub-team 3A undertook the use of backward stepwise regression to build an econometric model. Its task was to present statistically significant macroeconomic variables affecting the level of energy poverty in the Czech Republic, Poland and Slovakia.

(3) University of Verona - appendix 4

During the event at the University of Verona, preliminary research results has been presented. Authors also presented a set of over 20 macroeconomic variables that were indicated in the literature on the subject as having an impact on the problem of energy poverty in the world.



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Based on the backward stepwise regression model, it was indicated that in the case of the Czech Republic, Poland and Slovakia, it was possible to distinguish macroeconomic variables that had a significant impact on shaping the level of energy poverty.

(4) Final conference in Katowice - appendix 5

During the final conference at the University of Economics in Katowice, the final research results were presented in a Flash presentation. Valuable suggestions were gathered from mentors and leaders, including those from the University of Bari, University of Southampton, VSB Czech Republic, TUKE Slovakia, and UE Katowice. Based on this feedback in research have seen a significant impact of the electricity prices for household consumers with all taxes and net electricity imports on the level of energy poverty in Czech Republic, Poland and Slovakia. In conclusion, it can be suggest that the governments of these countries take action on these variables, which can help manage energy poverty. Their identification and subsequent impact may help to reduce this problem in the analyzed post-coal economies.

Outcomes of the project work:

The main goal of investigated research was to assess the impact of selected macroeconomic factors on the level of energy poverty in the post-coal countries like Czech Republic, Poland and Slovakia. Verification of the statistical significance of selected variables in the analysed countries has been carried out using backward stepwise regression.

Based on the results obtained, it can be indicated that the greatest impact on the phenomenon of energy poverty in the analyzed countries have electricity prices for household consumers with all taxes and net electricity. In the study also showed significant significance the following variables: energy use per person, adjusted gross disposable income of households per capita in PPS, inflation rate, government deficit/surplus and government consolidated gross debt. The obtained research results allow the adoption of the research hypothesis, indicating the possible identification of macroeconomic variables that significantly shape the level of energy poverty in selected countries (Czech Republic, Poland, Slovakia).

In conclusion, it can be suggest that the governments of these countries take action on these variables, which can help manage energy poverty. Energy poverty alleviation strategies implemented in line with the low-carbon energy transition should consider important determinants of economic energy poverty and need to be better shaped and targeted, taking into account the diversity of households in terms of region.

A limitation of the study that should be noted is that although there are dozens of indicators and indicator frameworks designed to assess energy poverty, there is no best indicator because the phenomenon of energy poverty is highly context-dependent and specific countries experience specific poverty problems energy. On the low-carbon energy transition path, various indicators can be used to assess and monitor energy poverty.

Future research is needed to further analyze the economic drivers of energy poverty in the low-carbon energy transition by giving high priority to policies and measurement of targeted



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energy poverty alleviation in post-mining regions, which have their own issues and determinants of energy poverty.

In essence, the economic dimension of energy poverty is an important issue for academic society and policymakers as well. The economic dimension creates complex interconnections with the other dimensions. Practical implications of this research are that on its basis, decision-makers in each country can analyze the situation and assess the effectiveness of the implemented policies and measures.

The ultimate outcome of our project is a paper: *“Impact of the macroeconomic factors on the level of energy poverty-case of the Czech Republic, Poland, and Slovakia”*.

The paper was submitted to the journal “Economics and Environment” (100 points Ministry of Science and Higher Education, IF 1.2). The paper has been accepted to publication and will be published in the volume of journal 1/2025/

The documents that confirm the submission - appendix 6

Other results of project collaboration

None.



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