



ASSESSMENT OF RURAL DEVELOPMENT PROGRAMME RESULTS UNDER FOCUS AREA 2A: A COUNTERFACTUAL ANALYSIS FROM SLOVAKIA

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ENHANCED ANNUAL IMPLEMENTATION REPORTS 2017

With the enhanced Annual Implementation Reports (AIRs) submitted in 2017, RDP Managing Authorities were required to assess the RDP's results achieved in 2016 by answering the Focus Area-related common evaluation questions (CEQs).

Among these, the CEQ number 4 was particularly challenging because it required the netting out of the Common Result Indicator R2 (change in agricultural output in supported farms/AWU) to capture the net effects achieved under the [Focus Area 2A \(FA 2A\)](#).¹

In Slovakia, this challenging exercise was addressed by a consortium of evaluators who applied different statistical matching techniques to build a solid control group, and conduct counterfactual methods to assess the total net improvement of farms in terms of economic performance, farm restructuring and modernisation. The assessment was done by means of several judgment criteria and results indicators.



DESIGNING THE COUNTERFACTUAL ANALYSIS WITHIN THE RDP CONTEXT

The Slovak RDP contributes to FA 2A primarily through six measures: M1, M2, M4.1, M4.3, M6.3 and M16.² According to the intervention logic of the Slovak RDP, other measures such as M10, M11 and M13 under Priority 4 are also programmed to contribute secondarily to FA 2A, although this set of area-based measures covers only additional costs and income foregone.³ The counterfactual analysis was designed to account for both contributions: primary and secondary.

Secondary contributions were assessed for their potential effects (positive and/or negative) on the economic performance of supported farms. In addition to the set of area-based measures mentioned above, the evaluation framework agreed with the Managing Authority also took into consideration the potential effects of M14 (payment for animal welfare), given its high level of uptake and relevance in the Slovak RDP. Through this analysis, RDP stakeholders could gain additional information regarding the economic performance of supported farms.

In total, the counterfactual analysis was designed over a sample of 27 farms supported through projects under the FA 2A (primary contributions) and 6,127 farms receiving support from area-based measures (secondary contributions).



FURTHER INFORMATION

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For additional information on the method used and PSM:

- [Counterfactual impact evaluation of EU rural development programmes - Propensity Score Matching methodology applied to selected EU Member States. Volume 1: A micro-level approach](#)



Working Steps of the Evaluation:

Preparatory activities started in January 2016 with the contracting of the independent evaluator. These activities included:

1. The establishment of agreements between the Managing Authority, evaluators, and Paying Agency, to collect data from beneficiaries and non-beneficiaries.
2. The setting up and continuous revision of the evaluation framework, which takes into consideration primary and secondary contributions.
3. The identification and revision of the common evaluation elements, as well as the development of additional judgment criteria in collaboration with the Managing Authority.
4. The screening of potential methodologies and data sources to design and apply the counterfactual analysis.

Four main data sources were used for the assessment:

- A regular yearly survey issued by the Ministry of Agriculture to a representative sample of Slovak Farmers (i.e. 2700 farms representing 80% of agricultural land). The survey collects data for around 400 indicators;
- The operations database of the Paying Agency (PA) on investment measures supported by the RDP 2007-2013 and 2014-2020;
- The IACS (Integrated Administration and Control System) database of the PA for the years 2013-2016. IACS data is used for assessing M11, M13, M14 and other area-based measures;
- Additional qualitative tools to validate quantitative findings (i.e. 5 expert interviews and 1 focus group).

The Counterfactual Method:

The counterfactual analysis was based on the application of statistical matching techniques, Propensity Score Matching (PSM) and Difference-in-Differences (DiD). PSM helps to reduce the selection bias in comparing the changes in several result indicators between RDP beneficiaries and non-beneficiaries (control group). Graph 1 and 2 show how the application of the PSM helped to select the groups with equal/similar probability to participate in RDP support. One can see this from the density area below the intersection of the treated and untreated curves, which represents the region with the common propensity scores of the two groups to participate in the programme. The DiD matching helps to compare result indicators in both groups, before and after the RDP intervention.⁴ A summary of the main steps undertaken are as follows:

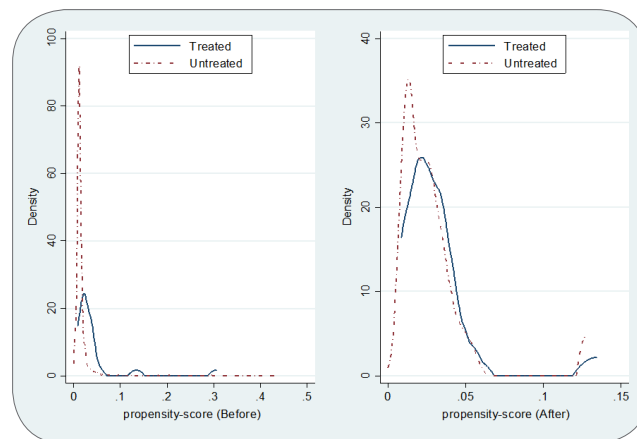
1. Estimation of the “propensity score” to create a balanced control group;
2. Matching of beneficiaries with non-beneficiaries with the similar propensity score;⁵
3. Computation of the Average Treatment Effects (ATE) between the matched groups (PSM), and before-after the RDP support (DiD);
4. Conduction of a Sensitivity Analysis to test the stability of obtained findings.

The combination of PSM and DiD methods are highly applicable when result indicator values on beneficiaries and control groups are available for both “before” and “after” the supporting period.⁶

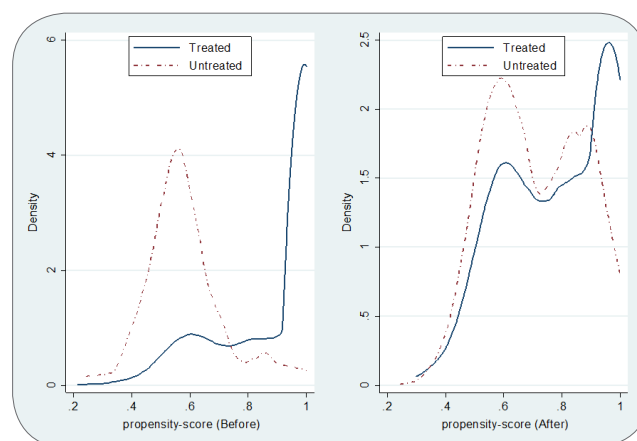
The application of the counterfactual analysis allowed the evaluator to calculate the gross and net values of common and additional result indicators at farm level including the change in Gross Value Added (GVA) and Agricultural Output over Annual Working Unit (AWU).⁷ All values obtained are reported in the [Slovak AIR 2017 published on the Ministry website](#). Furthermore, through the use of this method the evaluator was able to recommend the most efficient grant allocation per each supported project through investment measures, and the most effective combination of RDP measures for increasing leverage effects, reducing deadweight, and boosting farm competitiveness.

Effects of performed matching (finding acceptable control groups) with PSM – DiD:

Graph 1: Primary effects on FA2A:
significant reduction of selection bias -80%



Graph 2: Secondary effects on FA2A:
significant reduction of selection bias -90%



¹ FA2A (Improving the economic performance of all farms and facilitating farm restructuring and modernisation, notably with a view to increase market participation and orientation as well as agricultural diversification).

² M1 (knowledge transfer and information actions), M2 (advisory services, farm management and farm relief services), M4.1 (support for investments in agricultural holdings), M4.3 (support for investments in infrastructure related to development, modernisation or adaptation of agriculture and forestry), M6.3 (business start-up aid for the development of small farms), M16 (cooperation).

³ M10 (agri-environment-climate), M11 (organic farming), M13 (payments to areas facing natural or other specific constraints), Priority 4 (Restoring, preserving and enhancing ecosystems related to agriculture and forestry).

⁴ Among the programmed measures with primary contributions to FA 2A, only Measure 4.1 was activated in 2016. In total, 51 projects were completed by December 2016, but only 27 could be included in the counterfactual analysis because the 2013 data was not available for the remaining 24 projects.

⁵ The propensity score matching used was based on the Caliper algorithm.

⁶ Reference period for before-after was 2013 and 2016.

⁷ Marek Pihulič (2017) 'Assessment of RDP results under the Focus Area 2A: The application of the counterfactual analysis in Slovakia'. Workshop on 'How to Report on Evaluation in AIRs: Experiences and outlook', Riga (Latvia).



RECOMMENDATIONS AND FURTHER REFLECTIONS

MAIN CHALLENGES AND LIMITS:

- The low number of finished projects (only 51) under M4.1 resulted in a small sample for the analysis, however, this was not a problem for the counterfactual analysis, due to the large number of non-supported farms.
- A large proportion of farms were supported from various measures (investment and area-based measures) making the attribution of results difficult to distinguish, as well as to disentangle primary from secondary contributions.
- For 2019 the number of non-supported farms is expected to decrease significantly (currently almost all farms participate in these support measures). This decrease could, subsequently, provide a challenge for the counterfactual analysis in the future.

SOLUTIONS TAKEN TO ADDRESS THE CHALLENGES:

- The obligation for beneficiaries of M4 to provide survey data to the PA.
- The Increased number of completed operations by 2019 should solve the problem of a small sample of beneficiaries (90% contracted allocation of M4.1).
- This problem was abated through introducing respective control variables in both groups of farms (e.g. the level of farm support from another measure). This was accomplished through the use of a robust empirical data base, which included roughly 1600 observations of agricultural farms. The database included roughly 500 variables per farm, which was collected during the period 2013-2016 through the farm bookkeeping database.
- A Generalized Propensity Score Matching (GPSM) is planned to be used to overcome this challenge in the future. GPSM is applicable when all the farms are supported and allows for the building of counterfactuals among groups who receive different intensities of support from the RDP.



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The Evaluation Helpdesk works under the supervision of Unit C.4 (Monitoring and Evaluation) of the European Commission's Directorate-General for Agriculture and Rural Development.

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