Evaluation of changes in conditions of economic sectors in the competence area of the Ministry of Economy and co-financed from European Union structural funds

EVALUATION REPORT SUMMARY

The evaluation is co-financed by the European Social Fund and the national budget under the Operational Program Priority Measure „Technical Support for information about the operational programme and its evaluation“ № CPMA-12.0.2-V-203 “Evaluation of European Union funds’ investment“. Commissioned by the Ministry of Economy.
1. AIM AND OBJECTIVES OF EVALUATION

Methodological tools and highly qualified staff (methodical centre) are necessary in order to achieve efficient, evidence-based and appropriately informed public policy planning, monitoring and evaluation.

During the stage I of the evaluation of changes in conditions of economic sectors in the competence area of the Ministry of Economy co-financed from European Union structural funds carried out in 2011, HERLIT-16 macroeconomic model, which divides Lithuanian economy into sixteen sectors, which were established in coordination with the Ministry of Economy, was developed. Given the fact that the aforementioned model was no longer applicable due to the changes in statistical system and new requirements for modelling and evaluation of the policy, the second stage of the research project was initiated.

The aim of this evaluation is to improve the use of EU funds in 2014-2020 by updating the model and determining the effect of EU structural funds on economic sectors in the competence area of the Ministry of Economy in 2007-2013.

4 objectives of evaluation were implemented to achieve the aim of the evaluation:

- To update the model by adding the area of human resources and dividing the economic areas in the competence area of the Ministry of Economy and co-financed from EU funds into sectors and sub-sectors based on the Operational Programme's priorities and objectives attributed to the Ministry of Economy;
- To update the model by adding new economic (based on NACE rev. 2 classification) and monitoring indicators (based on Operational Programme) taking into account the areas of economy attributed to the Ministry of Economy in 2014-2020;
- To evaluate the impact of the EU structural assistance on the sectors of economy in the competence area of Ministry of Economy and macroeconomic indicators in 2007-2013;
- To estimate the impact of EU structural funds' investments on the sectors of economy in the competence area of Ministry of Economy and macroeconomic indicators in 2014-2020.

2. METHODS OF EVALUATION

HERMIN / HERLIT macroeconomic model was the theoretical basis of the evaluation. In the national and EU practice of public policy analysis macroeconomic models are one of the most recognized instruments for the impact evaluation of the Programmes’ investments. HERMIN macroeconomic modelling system is designed to analyse and evaluate medium and long-term impact of the state interventions. These models are used in evaluations commissioned by the European Commission and the European Parliament.

During the evaluation HERLIT-16 macroeconomic model was updated and automated. Updating the model was essentially the preparation of the new model, i.e. data for 900 indicators was recollected, dependences between the indicators used in the model were verified, baseline scenario reflecting possible economic development was constructed, etc.
The new updated model incorporates all mechanisms of the Cohesion Policy delineated in the economic theory. The updated model, as well as other versions of the model, is characterized by the fact that it incorporates the mechanisms of both the demand-side (Keynesian) and the supply-side of the economy. These mechanisms are represented in a stylized figure (Figure 1). **Short-term demand-side effects** occur as a consequence of an increase in expenditure and income policy instruments associated with the Cohesion Policy interventions, i.e., due to demand-side effects additional GDP (additional employment, etc.) is generated as a response to an increase in expenditure (or as a response to the EU investments’ funds which reached the economy). This effect occurs in the period of implementation of the Operational Programme(s) and disappears when the operational Programme(s) ends (since the funds of the Operational Programme(s) are no longer present).

**FIGURE 1. EU INVESTMENT EFFECT ON DEMAND AND SUPPLY-SIDE**

*Source: BGI Consulting*

Demand-side effect is important and should not be ignored. Nevertheless, in the case of Cohesion Policy the demand-side effect is only of a transitory importance, since **the Cohesion policy interventions are aimed at improving the long-term economic potential** (transforming and modernising the recipient economy to make it more capable of coping with the competitive pressure existing in the Single Market). Therefore, the purpose of the EU investments’ funds is a **supply-side effect**. From the economic theory perspective, the EU investment creates impact by activities which:

- Improve the physical infrastructure, which private sector could use for production activities;
- Improve human resources (e.g. investments in training), which private sector could use for production activities;
• Direct public financial support to the private sector to encourage investment and efficiency of production activities, thus increasing the productivity of the factors of production and reducing the expenditure on capital and production incurred by the sector;
• Improve the R&D base, which the private sector could use to be more competitive both in the Single and in the global markets.

Intervention scenarios regarding the investments administered by the Ministry of Economy were simulated by applying the updated model: an expenditure scenario for the EU structural assistance investment package for the period of 2007-2013 (around EUR 1 587 million) and an expenditure scenario for the EU structural assistance investment package for the period of 2014-2020 (around EUR 994 million). Distribution of annual financial injections was compiled based on the actual expenditure data and the projection until 2019 provided by the Ministry of Economy, as well as on the assumptions of the evaluator's experts regarding the possible absorption of funds in the period of 2020-2023.

3. OVERVIEW OF THE RESULTS OF EVALUATION

The final result of the evaluation – a unique, automated, updated HERLIT-16 macroeconomic model tailored to the needs of the Ministry of Economy and the evaluation of the impact of investments of two programming periods (2007-2013 and 2014-2020) on the country’s economy and areas administered by the Ministry of Economy.

Overview of the results of evaluation is provided in further text.

3.1. SELECTION OF THE SECTORAL STRUCTURE OF THE MODEL

In HERLIT-16 macroeconomic model, developed during the stage I of the evaluation of changes in conditions of economic sectors in the competence area of the Ministry of Economy co-financed from European Union structural funds carried out in 2011, Lithuanian economy is divided into sixteen sectors, established in coordination with the Ministry of Economy. As previous modelling experience have shown, such sectoral structure is representative of the variety of economic activities within the economy of the country and of the mechanisms through which EU investments impact the economy. However, statistical data used in the previous model corresponded with NACE rev. 1.1 classification. Therefore, the evaluators reassigned 64 economic activities reflecting NACE rev. 2 classification, the data of which is available publicly, to every sub-sector of HERLIT-16.

The analysis of the project promoters' data and the priorities and objectives of the 2007-2013 programming period showed the sub-sectors, which the beneficiaries from the Ministry of Economy's areas of competence are concentrated in. Links between the interventions and the sub-sectors of the model suggest that sectors and sub-sectors of the economy, which are used in the model, are representative of the Operational Programme's priorities and the objectives assigned to the Ministry of Economy.

3.2. UPDATING THE MODEL AND ADDING NEW INDICATORS

During the stage I of the evaluation the monitoring system was divided into two main parts: economic indicators' monitoring system and specific sectoral indicators' monitoring system.
Economic indicators’ monitoring system, developed during the stage I of the evaluation, encompass all the endogenous and exogenous indicators required to develop HERLIT-16 model and perform the modelling tasks. In total, there are over 900 economic indicators. This economic indicators’ monitoring system does not change, since it represents all important economic phenomena, processes and their tendencies.

In the case of sector-specific indicators there is a need to propose new indicators. That is first and foremost due to the inclusion of a new area – Human Resources. Changes made by the evaluator’s experts regarding the modelled sector-specific indicators were included in the updated model.

The design of the updated model validates its relevance for the impact evaluation of the EU funds’ investments. All the mechanisms of the Cohesion Policy delineated in the economic theory are incorporated in the model, i.e. the model incorporates the mechanisms of both the demand-side (Keynesian) and the supply-side.

In compliance with the Technical Specification the updated HERLIT-16 model is fully automated. Therefore, it is suggested to apply the updated model as an assistance tool in the operational activities of the Ministry of Economy as an Intermediary Body.

3.3. THE IMPACT OF 2007-2013 EU STRUCTURAL ASSISTANCE

The impact of changing socio-economic situation in Lithuania on the subject of evaluation. During the 2007-2013 period of the EU structural assistance, both a significant economic downturn and a full recovery of the economy were observed. The analysis showed that changing socio-economic situation in Lithuania and the change in macroeconomic indicators (with certain exceptions such as the Energetics sector) significantly affect the state of areas administered by the Ministry of Economy. The indicators reflecting the state of RTD, Business and Business Environment, Tourism and Human Resources sectors were highly affected by the economic downturn and the recovery. Therefore, prospects of the development of these areas directly depend on the changes in socio-economic conditions. RTD area is a slight exception in this regard as prospects of its development are hindered not so much by economic changes, but by systemic political deficiencies, which cause business expenditure on RTD to remain extremely low and thus do not allow businesses to employ experimental development to create high value-added products, which would be competitive globally.

Economic changes did not have a negative impact on the prospects of development of the Energetics area. Lithuania already exceeds the EU-28 average for the share of energy from renewable resources. Although the energy intensity remains much higher than the EU-28 average, it is steadily declining and further implementation of the measures to increase the energy efficiency should contribute to this trend.

The impact of the total 2007-2013 EU structural assistance expenditure package on the macroeconomic indicators. In order to evaluate the impact of the EU structural assistance for the period of 2007-2013 on the country’s economy and the areas administered by the Ministry of Economy, an expenditure scenario, encompassing the whole investment package of the Ministry of Economy (around EUR 1 587 million), was simulated. Simulation results revealed the impact of the EU structural assistance for 2007-2013 on the macroeconomic indicators as well as the indicators reflecting the state of specific areas.

A simulation of the scenario carried out with the updated HERLIT-16 model showed that the EU structural assistance had a positive effect on macroeconomic indicators, while magnitude of the impact depends on the relationships existing in the economy and the annual financial injections. For example, as the annual EU structural assistance’s injections increase during the period of implementation of the Operational Programme, the annual impact on the level of GDP increases as well.
In 2010, when a financial injection is the largest, the GDP level is around 1.1 percent higher compared to the scenario without the investments (Figure 2). Up until 2015 the impact varies depending on the EU structural assistance's financial injections. In addition, the demand-side impact is increasingly supplemented by the growing supply-side effects. Once the provision of the EU structural assistance is finished by 2016, a modest long-term impact remains, which causes the GDP level to be 0.4 percent higher compared to the scenario without the investments. This impact is caused by the improvements in the stock of physical infrastructure, human resources and R&D.

FIGURE 2. ANNUAL INCREASE IN GDP AND EMPLOYMENT LEVEL IN PERCENTS, IN COMPARISON WITH THE SCENARIO WITHOUT THE INVESTMENTS

Source: BGI Consulting

As implementation of the Operation Programme advances, the level of additional employment created due to EU structural assistance administered by the Ministry of Economy increases (Figure 2). In the simulated scenario the highest number of 13 thousand additionally employed is achieved in 2011. However, the remaining long-term increase in the number of employed once the support ends in 2016 is relatively modest at around 1.2 thousand.

The impact of the total 2007-2013 EU structural assistance expenditure package for 2007-2013 on areas administered by the Ministry of Economy. A simulation of the scenario encompassing the whole EU structural assistance expenditure package for the period of 2007-2013 administered by the Ministry of Economy showed that the impact of EU structural assistance on the indicators (sector-specific indicators) reflecting the state of the separate specific areas is positive, while magnitude of the impact depends on the relationships existing in the economy and the way the indicators' values are expressed.

The return of the total 2007-2013 EU structural assistance expenditure package. A simulation of the scenario encompassing the whole EU structural assistance expenditure package for the period of 2007-2013 administered by the Ministry of Economy showed that additional GDP created by the projects implemented in 2007-2020 exceeds the costs of these projects 2 times (from the sources administered by the Ministry of Economy, expressed as a percentage of GDP), i.e. the value of the cumulative multiplier

1 The importance of a correct interpretation of the impact should once again be underlined in the case of simulation showing employees' dismissals coming up to and at the end of implementation of the Programme. In reality, the ending Operational Programmes will be replaced by the EU structural assistance for 2014-2020, which will bring with its positive impact on employment.
“CumMultP” is equal to 2.0 in 2020. Previous experiences of broad application of the HERMIN model shows that the ratio between the benefits provided by similar investments and investments themselves is often close to 2. The evaluated investments of EU structural assistance for 2007-2013 administered by the Ministry of Economy have a similar return. As a result, despite some aspects which limit the success of the investments (e.g. investments did not significantly increase business expenditure on RTD, which remains extremely low), the analysed investments are regarded as successful.

### 3.4. THE IMPACT OF 2014-2020 EU FUNDS’ INVESTMENTS

In order to evaluate the impact of 2014-2020 EU funds’ investments, several expenditure simulation scenarios were built.

Simulation results revealed the impact of the whole package of the EU funds’ investments administered by the Ministry of Economy (around EUR 994 million) on the macroeconomic indicators and separate sub-sectors of the economy. It also showed the impact of investments made in each area on the macroeconomic indicators and the impact of the whole investment package on the indicators reflecting the state of the separate areas.

**The impact of the whole 2014-2020 period expenditure package on the macroeconomic indicators.**

In comparison with the period of 2007-2013, the modelled investments are lower by around 40 percent in nominal terms. Thus, the simulation of the scenario encompassing the whole expenditure package for the period of 2014-2020 showed that the investments caused a lower change in macroeconomic indicators in terms of percentage (not only due to the lower scope of investments in terms of nominal value, but also due to a grown economy and increased prices).

The economic benefit of the EU investments is best reflected by the cumulative multipliers, which show, how much does the total economic benefit for the whole period from the beginning of the Programme’s expenditures exceeds the accumulated expenditures of the Programme. Simulation results revealed that additional GDP created by the projects implemented in 2014-2030 exceeds the costs of these projects 2.2 times (from the sources administered by the Ministry of Economy, expressed as a percentage of GDP), i.e. the value of the cumulative multiplier “CumMultP” is equal to 2.2 in 2030. Therefore, the most likely simulated scenario forecasts the EU investments in 2014-2020 to be at least as efficient as in the period of 2007-2013.

Magnitude of the impact on separate macroeconomic indicators depends on the relationships existing in the economy and annual financial injections. For example, as the annual EU funds’ investments’ injections increase during the period of implementation of the Operational Programme, the annual impact on the level of GDP increases as well. In 2019, when the largest financial injection is foreseen, the modelled GDP level is 0.55 percent higher compared to the scenario without interventions (Figure 3) due to the demand-side impact. Up until 2023 the impact varies depending on the financial injections (made from the sources administered by the Ministry of Economy). In addition, the demand-side impact is increasingly supplemented by the growing supply-side effects. Once the financial injections will have been finished by 2024, a modest long-term impact remains, which causes the GDP level to be 0.2 percent higher compared to the scenario without investments. This impact is caused by the improvements in the stock of physical infrastructure, human resources and R&D.
As implementation of the Operation Programme advances, the level of additional employment created due to EU funds’ investments administered by the Ministry of Economy increases (Figure 3). In the modelled scenario the highest number of 5.9 thousand additionally employed is achieved in 2020. However, once the support will have been finished by 2024, the remaining long-term increase in the number of employed is relatively modest at around 1 thousand.

**A less efficient (in comparison with the likely one) scenario, encompassing the whole 2014-2020 period investment package.** The most likely scenario is based on the assumptions that a common efficiency of the investments will be achieved. However, there is a risk that due to various factors results of the investments will correspond to the needs of business to a lower than expected extent. In order to evaluate the impact the fulfilment of such risks would have, a less efficient (in comparison with the likely one) scenario, encompassing the whole Ministry of Economy’s investment package for 2014-2020, was additionally simulated. In the case of a less efficient scenario, the impact of the demand side of the economy is nearly identical to the demand-side impact of the most likely scenario as increase in expenditure in the economy creates analogous multiplicator effects (Figure 4). The difference, compared with the most likely scenario, begins to emerge during the last years of implementation of the Operational Programme. If the results of the projects poorly corresponded to the needs of business, their contribution to the increase in productivity and output of businesses would be limited. Therefore, a significantly more modest supply-side effect remains once implementation of the Operation Programme ends, in comparison with the most likely scenario.
Comparison of a likely and a less efficient scenarios is a good illustration that it is important not only to absorb the EU funds for Lithuania in time (or as quickly as possible) but to ensure efficiency of the investments as well, by seeking that results of the projects would correspond to the needs of the business as much as possible and thus would contribute to the increase in productivity and output of businesses more in the long term.

The impact of the whole 2014-2020 period investment package on the separate sub-sectors of the economy. The analysis of impact on separate sub-sectors of the economy showed that each sub-sector is characterized by a distinctive reaction to demand and supply-side effects. In the case of manufacturing sub-sectors, an insignificant decline is possible during implementation of the Programme. Such decline is caused by an insignificant decrease in international competitiveness, which occurs due to the demand-side impact of EU funds’ investments, which tightened the labour market and increased the wage level. Meanwhile, once implementation of the Operational Programme ends, the long-term increase in the level of gross value added in the manufacturing sector, caused by the improvements in the stock of the factors of production, remains.

The impact of EU funds’ investments on the market services sector is different than the impact on the manufacturing sectors. In the case of the market services sectors, growth caused by the demand-side is modelled during implementation of the Operational Programme. EU funds’ investments administered by the Ministry of Economy result in the long-term growth in output and productivity after implementation of the Operational Programme in the areas, where investments into the improvement of the stock of existing factors of production are made.

The impact of area-specific investments in the period of 2014-2020. Impact evaluation of EU funds’ investments in every specific area administered by the Ministry of Economy revealed that the highest economic benefit is expected from the projects in the RTD area administered by the Ministry of Economy – additional GDP created by the implemented projects in 2014-2030 exceeds the associated EU funds’ investments’ expenditures 3.19 times (expressed as a percentage of GDP), i.e. value of the cumulative multiplier “CumMultP” is 3.19 in 2030. The impact created by the projects in other areas administered by the Ministry of Economy is lower – value of the cumulative multiplier “CumMultP” is 2.39 in the area of Human Resources, 2.29 in the Energetics area, 2.03 in the Tourism area and only 1.59 in the Business and Business Environment area in 2030. It also has to be stressed that the higher economic benefit of the
projects that are being implemented or are already implemented in the RTD and Human Resources areas already emerge during the implementation of the Operation Programme. For example, additional GDP created by the projects implemented until 2020 in the RTD area exceeds the costs of these projects (from the sources administered by the Ministry of Economy) 1.67 times and in the Human Resources area - 1.64 times, in comparison with 1.11-1.45 times in the other areas.

Nevertheless, despite the higher modelled return of the investments in the RTD area, increased financing of the RTD area at the expense of other areas might not bring additional benefit. Such conclusion is based on the available scientific literature, which argues that strategies based only on separate components, e.g. only directed at improvement of the human capital or the infrastructure might result in the funds not providing the aspired effect.

**Simulation of the impact of the financial instruments.** Differences in the socio-economic impacts of subsidy measures and financial instruments were taken into account during the simulation of financial instruments’ funds’ injection into the economy. Re-use of the resources is an exceptional trait of financial instruments in comparison with the subsidies. Consequently, the likely scenario possesses a higher long-term impact than the scenario, where the resources devoted for financial instruments are simulated as subsidies. However, it would not be appropriate to use only the financial instruments for the funding of SMEs, as the application of subsidy measures is preferable in some cases.

**The impact of the total investment package for 2014-2020 on the indicators reflecting the state of separate areas.** The simulation encompassing the whole investment package for 2014-2020 revealed that the impact of EU funds’ investments on the indicators reflecting the state of specific areas (sector-specific indicators) is positive, while magnitude of the impact depends on the relationships existing in the economy and the way the indicators’ values are expressed. For example, the impact on the wage level in terms of percentage is higher than the impact on GDP not only because the growth of the wage level exceeds the growth of productivity but also because the impact on GDP is expressed in constant prices (for the purpose of comparability), while the impact on the wage level is expressed in nominal prices.

### 4. FURTHER USE OF THE UPDATED MODEL

Methodological tools and highly qualified staff (methodical centre) are necessary in order to achieve efficient, evidence-based and appropriately informed public policy planning, monitoring and evaluation. The methodological instruments previously disposed by the Ministry of Economy were not appropriately prepared for analytical work as they lacked automation and the existing macroeconomic model was only used to a limited extent. The updated model addresses these restrictions, thus the Ministry of Economy have an opportunity to apply it more broadly:

- It is suggested to apply the updated HERLIT-16 macroeconomic model as an assistance tool in the operational activities of the Ministry of Economy related to analysis, forecasting, planning and evaluation.
- In order to turn the model into a fully-fledged assistance measure, it is suggested to ensure the required human resources and functionally separate the tasks of the individuals, who are carrying out the evaluation based on the simulation results, from the planning function.
- It is suggested to analyse, by applying the model, the scenarios of EU funds’ investments’ expenditures provided in the instruction of the model.
• It is recommended to accumulate the knowledge required to improve the accuracy and reliability of simulations.
• It is recommended to initiate monitoring, which would allow to collect the micro (project) level data periodically and check, whether the selected financed projects deliver a satisfying return; and, in case of need, to adjust the selection procedures so that the projects delivering the highest possible return would be selected for financing.