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## Local Multiplier as a Tool for Quantification of social and Economic Aspects of the Region = Mnożnik lokalny jako narzędzie do kwantyfikacji społecznych i ekonomicznych aspektów regionu

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# LOCAL MULTIPLIER AS A TOOL FOR QUANTIFICATION OF SOCIAL AND ECONOMIC ASPECTS OF THE REGION / Množnik lokalny jako narzędzie do kwantyfikacji społecznych i ekonomicznych aspektów region

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## STRESZCZENIE

Celem artykułu jest określenie wpływu wybranych podmiotów leśnictwa i ochrony przyrody w Republice Czeskiej, na rozwój gospodarczy i społeczny danego terytorium z wykorzystaniem metodologii obliczania lokalnego mnożnika. Do studium przypadku wybrano następujące organizacje: Lasy Miejskie Pisek sp. z o.o., Przedsiębiorstwo Szkoleniowe Leśnictwa – Las Masarykův Křtiny i Administrację Parku Narodowego Podyjí.

**SŁOWA KLUCZOWE:** REPUBLIKA CZESKA, GOSPODARKA, PRZEDSIĘBIORSTWO, LOKALNY MNOŻNIK, ZARZĄDZANIE, REGION.

JEL CLASSIFICATION: Q23, Q57

## ABSTRACT

The aim of this article is on an example of selected subjects of forestry and nature conservation in the Czech Republic quantify their impact on the economic and social development of the area using the methodology of calculating the local multiplier. For the case study were selected the following organization: Pisek City Forests Ltd., Training Forest Enterprise Masaryk Forest Křtiny and Podyjí National Park Administration.

**KEY WORDS:** CZECH REPUBLIC, ECONOMY, ENTERPRISE, LOCAL MULTIPLIER, MANAGEMENT, REGION.

## 1. INTRODUCTION

The research topic of this field is a reaction to the so far untreated problems of the local economy in the field of forest management and protection of nature and landscape which result from the goals mentioned in the strategic documents of sustainable development and which are valid both nationally and internationally.

Shuman (2000) defines the economic localization as follows: „the process of economic localization means that locally-owned enterprises use local resources in a sustainable way, employ local workers for adequate wages and serve primarily to local consumers. Consequently, this process puts the decision-making processes back to the community and decreases its dependence on imports”.

Localization of the enterprises into regions brings many advantages, especially for the local economies. This was confirmed for example by Douthwait (1996); Shuman (2000). The benefits of the forest enterprises to the local economies are combinations of social and economic benefits.

Since their management is bound to rural regions, the forest enterprises represent a specific part of the state economy. The importance of small and medium-sized forest enterprises in the European Union for the employment and regional development was explored for instance by Tunkele, et al. (2011).

A local economy which has preserved at least a part of its local economic links (enterprises owned by local people, local production using local sources, local sales and investing the local funds locally) is not only less vulnerable from the globally economic point of view but also more

efficient in terms of lower energy and natural resources waste.

The local multiplier (LM) is highly suitable as an indicator of the sustainable development. There are several types of local multipliers, but the local multipliers 2 and 3 (LM2, LM3) are used most often.

The LM2 focuses on the first two rounds of the fund circulation – i. e. on the total revenues and the local expenditures of the investigated operator. The LM3 comprises of the first two rounds with the same scheme as the LM2, but it adds an extra third round in which the local expenditures of all those who received funds from the investigated operator during the second round (i.e. the beneficiaries of the local expenditures) are quantified. In organizations, these beneficiaries are mainly suppliers and employees.

In the Czech Republic, the local multiplier calculation has not become general knowledge. The issue of local multipliers has been tackled by Kutáček (2007a,b) a Johannisová (2007, 2008). The calculation methodology was also employed in a small number of final theses, e.g. those of Došek (2006); Ježková (2008); Novotná (2011); Rejmanová (2014); Březina (2014) Silovská (2015); Březina et al. (2015, 2016). Of the foreign authors, the theme was dealt with for example by Sacks (2002); Cimadomo, Bénassy-quéré (2012).

The aim of this article is on an example of selected subjects of forestry and nature conservation in the Czech Republic quantify their impact on the economic and social development of the area using the methodology of calculating the local multiplier.

## 2. MATERIAL AND METHODS

As interest areas were chosen 3 organisations – Podyjí National Park Administration, Training Forest Enterprise Masaryk Forest Křtiny and The Pisek City Forests, Ltd.

Podyjí National Park Administration (hereinafter referred to as "Podyjí NP or Administration"), with its seat in Znojmo was established on 1<sup>st</sup> July, 1991 by the Ministry of the Environment of the Czech Republic. The basic task of this organisation is to ensure the protection of nature and landscape on the territory of Podyjí NP and its buffer zone.

The beginnings of the large-surface-area protection of the middle reach of the Dyje river date back to 1978, when the Podyjí Protected Landscape Area was declared

on an area of 103 km<sup>2</sup>. The majority of this area was included in the militarised border zone and was closed to the general public. After the political changes in 1989 preparations were made to declare this territory with exceptional natural quality as a national park, which was achieved in 1991. Podyjí NP is the smallest national park in the Czech Republic on area as the NP covers 6,300 ha with a buffer zone of 2,900 ha. Podyjí NP primarily includes the valley of the middle reaches of the Dyje river between Vranov nad Dyjí and Znojmo, along with state border with Austria. (Podyjí NP Administration)

The Training Forest Enterprise Masaryk Forest Křtiny (hereinafter referred to as "TFE Křtiny") is located near Brno, the second largest city in the Czech Republic (CR). Brno has about 400 thousand inhabitants. One third of the TFE Křtiny is located in the Moravian Karst Protected Landscape Areas. The forests are sub-urban and widely used for recreation.

The TFE Křtiny total area is 10,495 ha. The forest cover is approximately 98%. The enterprise is divided into three forest districts – Vranov (3,345 ha of forest land), Habrůvka (7,006 ha of forest land) and Bílovice nad Svitavou (2,920 ha forest land). The forests are situated at altitudes ranging from 210 to 575 m above sea level and feature a great variety of natural conditions. This area dominates mixed woods, with 46% coniferous and 54% deciduous tree species. There are about 116 forest types situated in 4 forest altitudinal vegetation zones. (TFE 2017)

The Pisek City Forests, Ltd. (hereinafter referred to as "Pisek City Forests") is a company founded by the city of Pisek to manage a forest area of 6,500 hectares. The company is owned by the city of Pisek to which it is accountable for its managing. The running of the enterprise is also supervised by the appropriately elected members of the supervisory board. The forest administration, which is divided into 11 sections, ensures the overall running of the enterprise and governs the forest rangers. Its forestry assets are large; they reach from the forest Boudy u Mirotic in the northern part of the district through the forests around Dědice, on Lísek, and in Sloupovny to the mountain range of Písecké Hory which is a part of the National Park Písecké Hory and lies near to Albrechtice nad Vltavou. (Pisek City Forests 2017)

## SOURCES

For the needs of the calculation of the first round of the LM2, LM3, the data were transformed from the economic information system of organization (account class 6 – account groups 60, 64, or 69). For the needs of the cal-

calculation of the second round of the LM2, LM3 a transformation of the data of the account class 5 (account class 51, 52) was carried out. The specific used items of the revenues and expenditures of organization are stated below in the methodology.

A questionnaire survey was carried out to gain the data for the calculation of the third round of the LM3.

**Example of the survey for the employees**

Items of expenditure:

- food, drink, tobacco
- clothing, footwear
- housing
- water, energies
- transport, fuels
- postal services, telecommunication
- property tax
- other taxes
- repayments (credits, loans, insurances, saving)
- recreation, sport, culture
- other goods and services.

**Example of the survey for the suppliers**

Items of expenditure:

- expenditures on staff
- repayments of loans and credits
- property tax
- other taxes
- water, energies
- rents, building operation
- fuels
- postal services, telecommunication
- promotion, advertisement
- other goods and services.

**METHODOLOGY**

**Calculation of the LM2**

Calculation pattern:

$$\frac{1st\ round + 2nd\ round}{1st\ round} \quad (1)$$

in which 1<sup>st</sup> round = total revenues of the investigated subject; 2<sup>nd</sup> round = local expenditures of the investigated subject.

1<sup>st</sup> round of the calculation includes the total revenues of organization. Items of revenues:

1. Revenues from sale of services
2. Revenues from sale of own goods
3. Revenues from rent
4. Revenues from sale of tangible fixed assets (except for plots)
5. Revenues from sale of material
6. Revenues from transfers (subsidies for the activity)
7. Other revenues related to the main activity

2<sup>nd</sup> round of the calculation: the total expenditures of organization were sorted into the expenditures spent locally and those spent non-locally. The non-local expenditures are not included in the calculation.

With the local expenditures, it is necessary to find out:

1. Expenditures on staff (only salary costs).
2. Expenditures on suppliers.

**Calculation of the LM3**

Calculation pattern:

$$\frac{1st\ round + 2nd\ round + 3rd\ round}{1st\ round} \quad (2)$$

Where the round 1. = total revenues of the researched subject; the round 2. = local expenditures of the researched subject; the round 3. = local expenditures of the beneficiaries of the round 2 (beneficiaries of the funds from of organization – local suppliers, employees).

The 1<sup>st</sup> and 2<sup>nd</sup> round of the calculation contains the same items as in the LM2 (see above).

A questionnaire survey is necessary for the 3<sup>rd</sup> round of the calculation of the LM3 which will allow for determining:

1. The net annual income of each employee of organization as well as the structure of their expenditures,
2. The amount of annual expenditures of the significant local suppliers of organization as well as the structure of their expenditures.

### 3. RESULTS

#### PODYJÍ NATIONAL PARK ADMINISTRATION

Calculating the LM2 score, it has been discovered that another CZK 30.4 million was created for the inhabitants of the district of Znojmo in 2012 by the Administration. The value of the calculated LM2 score was 1.43 (which is an average value of the score). Since the LM2 values range from 1 to 2, it is possible to claim that, despite the fact that the Administration spent 93% of their expenditures on salaries of local employees and 58.77% of their expenditures on important local suppliers, 41.23% of the expenditures on important suppliers still leave the district of Znojmo. These non-local expenditures decrease the value of the LM2 score. To increase the LM2 score, it is recommended to use more services by local suppliers, mainly in relation to activities which are not directly linked with nature protection and forest management. In the case of public procurements, however, the price is also important; still, it is just this type of subjects, such as the NP Administration is, which should support the regional economy and the development of the entire district.

The calculation of the LM3 score shows that the Administration created additional CZK 65 million in the district of Znojmo for its inhabitants in 2012. The value of the LM3 score (1.92) expresses a high value of the local multiplier. That means that the Administration creates CZK 19.20 for the local economy in the district of Znojmo of each ten crowns it obtains as its revenue. Each crown of the Administration's expenditures creates 1.92 crowns for the local economy. And each crown of the expenditure creates 0.92 of an additional crown of the revenue for the local economy. This final score attests to a strong local economy ( $1.92 - 1 = 0.92$ ). KUTÁČEK (2007A) argues that if the value of the score is higher than 1.80, it signifies a strong local economy. At the same time, he claims that, although its values can theoretically range from 1 to 3, the real highest value of a calculated LM3 Score is up to 2.2.

#### TRAINING FOREST ENTERPRISE MASARYK FOREST KŘTINY

Based on the calculation of the LM2 score, it has been discovered that additional CZK 40.0 million was created for the inhabitants of the districts of Brno-venkov and Blansko in 2014 by the forest district of TFE Křtiny. The calculated LM2 score valued 1.23 (which represents a low value of the score).

The LM3 score calculation showed that the forest district of TFE Křtiny created additional CZK 90.5 million for the inhabitants in the districts of Brno-venkov and Blansko. The value of the calculated LM3 score (1.52) represents an average value of the local multiplier. Hence, TFE Křtiny makes 15.20 crowns for the local economy in the districts of Blansko and Brno-venkov of each 10 crowns it gains as its revenue. Consequently, each crown of the expenditures of TFE Křtiny creates 1.52 crowns for the local economy while each crown of the expenditures constitutes 0.52 of an additional crown of the revenue for the local economy ( $1.52 - 1 = 0.52$ ).

It follows from the above-mentioned that the management of TFE Křtiny should focus on increasing the share of the local suppliers or on informing their employees.

These recommendations, however, are rather problematic. As for their suppliers, the enterprise must observe the Public Procurement Act, pursuant to which it cannot take into consideration whether the suppliers are of the region or not. Influencing the consumer behaviour of its employees is questionable, too. The enterprise is not entitled to force its employees into supporting local shops. The only feasible solution seems to be to change the regional or national policy and to introduce instruments which would support local economies.

TFE Křtiny is located near the second biggest city of the Czech Republic—Brno. As a result, the forests provide socio-economic benefits, with regard to fulfilling their recreational function in particular. The aesthetic function is linked to it as well. Fulfilling their recreational and aesthetic functions, the forest ecosystems bring financial benefits to the economy in the form of jobs and business opportunities.

#### PISEK CITY FORESTS, LTD.

The calculation of the LM2 score for the district of Pisek discovered that Pisek City Forests created additional CZK 85.5 million for the inhabitants in 2015. The value of the calculated LM2 score was 1.60 (a high value of the score).

Based on the calculation of the LM3 score, Pisek City Forests created additional CZK 104 million for the inhabitants in the district of Pisek in 2015. The value of the calculated LM3 score is rather higher (1.73). It means that Pisek City Forests turns each ten crowns it gains into 17.30 crowns for the local economy in the district of Pisek. Thus, each crown of its expenditures constitutes 1.73 crowns for the local economy; therefore, each crown

of the expenditure creates 0.73 of an additional crown of the revenue for the local economy. This fact accounts for a strong local economy ( $1.73 - 1 = 0.73$ ).

## 4. DISCUSSION

In 2015, 184 suppliers of all the suppliers of Pisek City Forests (the total of 374) were local while 190 suppliers were non-local. The Pisek City Forests used services of local suppliers in 49.20% and spent 61.52% of their funds (CZK 29.1 million) on services of the suppliers from the district of Pisek.

In 2014, 30 suppliers of TFE Křtiny of the total of 54 were local and 24 non-local. In 55.56%, TFE Křtiny used the services of the local suppliers and spent 56.71% of their funds (CZK 13.3 million) on local suppliers and on services by suppliers from the districts of Brno-venkov and Blansko).

166 of all the 306 suppliers of the Administration of National Park Podyjí were local and 140 non-local in 2012. The Administration used the services of the local suppliers from the district of Znojmo in 54.25%. At the same time, they spent 58.82% of their funds (CZK 11.9 million) on services of suppliers from the district of Znojmo.

Comparing various types of organizations at different times, it is possible to see that the percentages of both the local suppliers and the spent funds in the demarcated interest areas of the operators are very similar.

The economic benefit of the calculation of the local multiplier may be seen in the potential to increase the regional employment, to support local households, business entities and in increasing the total local economy in the region. Thus, according to Shuman (2000), the decision-making processes could return to the region and its dependence on imports could be decreased. The regional policy also plays a significant role (Armstrong and Taylor 2000).

Apart from the economic benefit, the change in enterprise management will also affect the environmental and social profile of the organization.

The main aim of localization is to strengthen local economies which ensure basic human needs in a sustainable way. Other goals are to diminish the difference between social groups and gender, to improve the respect for human rights and justice and control in the decision-making processes (Hines 2000).

The calculation of the local multiplier enables the enterprises to find out to which extent their economic activities contribute to the development of the local economy. Consequently, this finding can lead to a change in the decision-making management of the enterprise with the aim of permanently sustainable development of forest management.

Effective decision-making on the ways of spending their funds may bring profit to local inhabitants and improvement in the competitiveness of the researched enterprise, including fulfilment of the strategic goals of the Government.

If the local economy is strengthened, it may result in a decrease in fiscal expenditures, for example, on social welfare benefits.

Forest enterprises should focus on increasing the share of the local suppliers, or on the education of their employees.

## CONCLUSION

It follows from the above-mentioned that the calculation of the LM2 is applicable in practice. Therefore, it is possible to apply it to other subjects. To determine the LM2 score, available exact data of the accounting system of the researched organization can be used. The calculation of the LM3 is also applicable in practice, yet it must be said that the correctness of the calculated LM3 score depends on the questionnaire survey (i.e. the number of the filled-in questionnaires).

The local multiplier seems to be a potential tool for investigation of the cash flows in the local economy of a region as well as one of the possible methods for determination of the potential of the socio-economic functions of the forest management with regard to the economic development of the interest area.

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