ORIGINAL SCIENTIFIC PAPER

THE REGIONAL MULTIPLIER EFFECT OF PILGRIM TOURISM

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ABSTRACT: Pilgrim tourism to religious regions is significantly growing worldwide. This type of tourism could influence the life of individuals and households in a city or village, as pilgrimages can help the regional economy to gain benefit. This paper outlines an integrative framework of multiplier effect and discusses its economic aspects with reference to pilgrim tourism. The framework accentuatess the identification of regional economy aspects of the multiplier phenomenon in terms of local relationships of business sectors The Leontief model's "input-output transaction table" provides an integrative framework which is presented in this paper and based on relevant international literature. The presented econometric model is focusing on the development and interpretation of the economic effect of a pilgrimage route in a region. By using the calculated multiplier effect of pilgrimage tourism, it becomes possible to make forecast on the impacts of a consumption change in on the region.

Keywords: tourism, multiplier effect, pilgrimage route, economy

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1. INTRODUCTION

Recently, pilgrimage grew to be a significant area of religious tourism. Pilgrimage is one of the most exciting emblems of Christian life deeply rooted in the Bible. "The ecclesiastical view of a human being, of a Christian as homo viator, is a person on journey, a pilgrim on earth on the way to the heavenly life. (Timothy, J.D. and Olsen, H.D. 2006). In several cases, related academic works discusse the complex economic, political, social, psychological and emotional relationship between pilgrimage and economy (Nolan, M.L., Nolan, S., 1992).

The main theoretical background stems from the Keynesian multiplier, which is the ratio between output variation and the initial exogenous variation of aggregate demand (Bénassy-Quéré et al., 2010). The primer assumption is on the Keynesian Multiplier that the consumption is a linear of current income. The marginal propensity to consume means that out of one additional dollar (or forint) of disposable income the people spend and save some part. There are some factors which influence the multiplier effect, for example:

- portion of the additional income accrues to consumers
- portionof the additional income consumers accrues to buying products or services
- share of disposable income leads household to consume of domestic and imported goods

In this paper the Keynesian assumptions are presented within the aggregate supply and aggregate demand model, assuming the production increases at any given price level.

In terms of the Leontief input – out model it is analysed how the initial demand shock shifts the local economic performance, and how the multiplier effect change the regional equilibrium. The majority of the current literature examines the relationship in macroeconomic level, in this paper such a method is presented which **applicable on meso level as well**.

The multiplier effect on macro-economic level was worked out by N. Gregory Mankiw and Agnes Bénassy-Quéré, the regional effect analysed by Harvey Armstong and Jim Taylor between the earliest in book Regional Economics and Policy.

Business actors are increasingly interested in the economic benefits of tourism at national, regional, and local levels. Regularly it is assumed that tourism supports some jobs in an area and generates many million Euros or Forints in additional sales or income in a city or village. Multiplier effects are often cited modelling method to calculate non-direct effects of tourism spending and show the wide range of industries' performance in a region that can be benefited by tourism. Tourism's economic results are taken into account by the sector for a variety of reasons. Assumptions of pilgrim tourism's economic relevance ensure the industry heightened respect in the business life in general. This often translates into business decisions or economic policies that are favourable to the local standard of life. (Vijayanand, 2012).

In this paper the study of pilgrimage's economic effect is based on the econometric model. Lébény is a settlement in Győr-Moson-Sopron County, Hungary, close to the Hungarian – Austrian border. In this small town a Romanesque monastic church van be found, which built in 1208, named St. James parochial church. Originally, the famous church was built cca 800 years ago as a Benedictian Monastery, thanks to this notable building a part of the St Jacob Pilgrimage runs in Lébény.

This paper demonstrates the suitable use of regional input-output (I-O) models showing the economic impact of pilgrim tourism on Lébény's region. The described model pro-

vides multipliers as an estimation of the economic effects that an initial change in service activity—such as increased accommodation—has on the regional economy. The initial change involves a change in final consumption for additional manufacturing or agriculture, an increase in government purchases, or an increase in household income. The basic data for the calculation of Lébény's economy are the next: In 2016 the total purchasing power was EUR 19,7 million, the number of population was 3229, and that means EUR 6100 purchasing power per capita.

Purchasing power is an indicator of per capita disposable net income after the deduction of taxes and social security contributions, including any received social insurance benefits. The study uses the relative figures of per person and per year purchasing power levels in Euros as index values (Appendix 1). GfK Purchasing Power uses to nominal disposable income, which means values are not adjusted for inflation. The study applies statistics on income and tax levels, government benefits and forecasts by economic institutes. Pilgrims use their general purchasing power to cover expenses related to eating, living, services, as well as other expenditures such as merchant purchasing.

The fundamental component is in the intermediate transaction table, which draws on the flow of output between producer and user actors, and predicted in terms of descriptions of regional activities. The regionalization of input-output coefficients is based on non-survey method using mainly secondary data and information (Szabó, 2015). For the purpose of local GDP calculation the total purchasing power is used for figuring out the regional economic performance. One of the possible sources to gather additional information is the published municipal budget. For example, in this paper the local tax figures of 2014 budget are used to estimate the company contribution to local government expenditure.

2. STATEMENT OF THE PROBLEM

In this paper the proper use of regional input-output (I-O) models is analysed. These models result multipliers that can be used to guess the economy-wide effects that an initial change in service activity (i.e. additional money spending for accommodation or catering) has on the regional economy. The initial change involves a change in pilgrim consumption, and might result growing in household consumption or government purchases, or an increase in exports opportunity. The main steps to calculate the impact of additional spending on the regional economy are described below.

2.1 Transaction Table

The Leontief input-output model formulated as a generalized econometric complementary problem. Input conditions for the existence of solutions are given, and solution tesults are base on assumptions. An application of the model to figure out the regional

effects is suggested. This is a basic introduction to the input-output analysis, which was founded by Vassilii Leontief in the 1930s. In the applied Leontief's input-output model there are four measures of changes in regional economic activity that can be estimated—gross output of four sectors, value added, earnings, and employment.

Table 1: Input-Output Transaction Table

<table>
<tr><td colspan="3"></td><td>Initial</td><td>Initial</td></tr>
<tr><td colspan="3"></td><td>Final</td><td>Total</td></tr>
<tr><td></td><td>Agriculture Mining Industry Services</td><td></td><td>Demand</td><td>Output</td></tr>
<tr><td>Agriculture
Mining
Industry
Services</td><td colspan="2" rowspan="2">Intermediate Inputs</td><td rowspan="2">Final Use</td><td rowspan="3">Total Gross Output</td></tr>
<tr><td rowspan="2">Payment for income owners</td><td rowspan="2">Primary inputs to industries</td><td>Primary inputs

to direct consumption</td></tr>
<tr><td>Input Total</td><td colspan="3">Total Gross Output</td></tr>
</table>

***S**ource: own edition*

The crucial question is how the local sectors' intermediate relationships can be quantified in the local input-output model if primary data are missing? One of the method used in this research is to use the national level sector metrics (such information are available in the Statistical Office database), and calculated benchmark can be figured out upon national level statistics. The regional sector gross output can be compared to final consumption in terms of sector matrix to calculate the benchmark figures, the local geographical, experimental information could be used for refining these ratios. For example in a city or village the gross output depends on the capacity and economic performance of the local companies and the export–import relationship with external partners. After some "model running" it can be used sector-specific multipliers as in this example, we automatically count with the mix of produces goods and services purchased and secondary effects for final consumers.

2.2 Regional Economic Performance

Table 1 depicts the original relationship between the components of total gross output, and the value added domestic product (GDP) as well. As shown in the table, inputs are consumed by producing and service providers sectors—these are the intermediate inputs, such as raw materials or semi finished inventories—and by final use. Value added is equal to the net income earned in production—this includes labour earnings so the re-

source to pay for income owners, which stems from the difference of totals sales and inpot purchases, so the total gross output is equal to the sum of intermediate inputs and value added value added summed across all industries is equal to regional GDP.

On the regional level the gross output is equal to the sum of the intermediate inputs and value added, which can be measured as the sum of the intermediate inputs and final use. Value added is defined as the value of gross output minus intermediate inputs excluding any income accumulations among companies. The added value is the source of the payments made for economic actors, namely for example the rewarding of employees in form of wages or salaries and the taxes on production and imports. So the transaction table shows the economic actors' contributions for the regional gross domestic product through household consumption, (local) government expenditures, net export figures, company investments, capital expenditures and import value (Moss, 2007).

2.3 Technical Coefficients

Considering the fractions of an input-output table shown in table 2 the technical coefficient, such economic ratio for a sector is calculated in terms of the next formula:

$$\mathrm{TC}^{n} = Fi / \sum_{j=1N}^{n} \mathrm{Fj}$$

Fi . . . Flow i

N . . . Number of rows in column

∑j=1N Fj . . . Column sum of the flow

Technical coefficients express the direct effects of change in final demand for a certain commodity. To measure indirect effects, namely interdependence coefficients reflect the change of performance in producing and service provider sectors.

Table 2: Technical Coefficients

	Agriculture	Mining	Industry	Services
Agriculture	a.1.1.	a.1.2.	a.1.3.	a.1.4.
Mining	a.2.1.	a.2.2.	a.2.3.	a.2.4.
Industry	a.3.1.	a.3.2.	a.3.3.	a.3.4.
Services	a.4.1.	a.4.2.	a.4.3.	a.4.4.

Source: own edition

The technical coefficients show the relation between the expenditure structure and the level of total purchase, sector by sector (Krekó, 1964). If we want, for instance, to determine the technical coefficient for industry, we obtain:

TC= a31/ total purchase in agriculture sector

3. THE METHOD: THE MULTIPLIER EFFECTS

In addition to understanding the effect of assumptions in the input–output model, it is important to quantify the regional effects by using the model's multipliers. Each oh the additional one Euro or Forint of demand for the buying of a sector results both indirect and direct income effects on the economy as a whole (Benassy-Quéré et al., 2010). The linkage between the initial spending and the total effects generated by the spending is known as the multiplier effect of the sector, or more generally as the impact of the sector on the economy as a whole (R. O'Connor and E. W. Henry. 1975). For this reason this study of multipliers could be be called as impact analysis. This can be completed by producing and service provider sector output multipliers and household income multipliers (Armstrong-Taylor, 1985).

In this paper multipliers are used to figure out the secondary effects of visitor spending in Lébény region. Indirect effects are the changes in sales, jobs and income within supplier industries in the region, i.e. businesses that supply goods and services to tourism-related firms. The economic mechanism, that causes an initial reaction to be amplified by follow effects among suppliers is the examined indirect multiplier effect, regardless of whether the shock arises change in technology or financial market (Acemoglu et, al., 2016). For example, hotels purchase a variety of goods and services in the local area in order to produce a night of lodging or retailers sell meals and beverages. Each business that provides goods or services to hotels or retailers benefits indirectly from visitor spending the town. These indirect effects are described by Type I multipliers.

Type I sales multiplier = (direct sales + indirect sales)/ direct sales

The additional income that ultimately gets to households is called disposable income, which explains, the induced effects. These evoked effects are the changes in income in the region, resulting more consumption because of pilgrim spending. Employees in the service sectors and supplier industries are spending their income in the region, thus causing additional sales and economic activity. Type II multipliers integrate both indirect and induced effects.

Type II sales multiplier = (direct sales + indirect sales + induced sales)/direct sales.

Net Effect of Additional Regional Economic Performance

Theoretically a unit increment of "independent" investment also causes an initial increase in income which generates successive rounds of consumer spending and incomes. Each circle producing numerically smaller increments until the process fully works itself out, in this case the new GDP can be calculated in terms of investment multiplication.. The difference between the original and modified gross regional output explains the net effect of additional spending in a sector. The full response to the control produces as savings should be equal to the initial unit increment of investment, or else the government spending and the consumer spending (household consumption) will be considerably larger than the initial value. In the examined model the consumption effect is verified considering the pilgrim spending. The applications of impact analysis do not comprise the examination of the effects of starting a new industry or discontinuing an existing one, or the comparison of industries by income and employment multipliers for a unit increment of investment.

The method of calculating multiplier ratios from the input-output martix is an inverse of the determinant (Scharnitzky, 1986). The so-called invertible matrix theorem is a major result in linear algebra which associates the existence of a matrix inverse with a number of other equivalent properties. A matrix possessing an inverse is called nonsingular or invertible matrix.

4. PROBLEM SOLVING: THE PRACTICAL APPROACH

To guess local economic impacts of pilgrim visitor service purchases, it has to be made a distinction between the bought service functions and that of the item-producing manufacturing and agriculture sector. In this input-output model this is handled by ignoring suitable mark up of the producer price which charged for the consumer (selling price).

It is assumed when households in the region increase their income, the saving does not change, so the aggregate consumption to be a "function" of aggregate income.. The model requires that the final-demand employees both work and reside in the location, and assumes that induced impacts from household purchases occur where the employees reside.

The studied region should be large enough to include the sectors supplying a large share of the direct inputs, but small enough to not overestimate the impacts. Smaller, less diversified, economically more homogeneous regions usually have smaller multipliers because these areas need to import more goods and services for the production. The main assumptions used for the original input-output model are listed in Appendix II. The regional purchasing power income is EUR 20 million, therefore by using the local consumption's total purchase power ratio (80%) we get an estimated EUR 16 million. The quantified regional input-output model can be found in Appendix I. In order to calculate the regional GDP the following figures are used: household consumption (EUR 16,00 million), export (EUR 26,38 million) plus investment (EUR 0,80 million) reduced by

import (EUR 24,06 million). The government effect is zero, because expenditure (EUR 0,60 million) equals the payments for the government (income from taxation), so the regional GDP is EUR 19,12 million.

Table 3: The Multipliers I.

	Agriculture	Manufacturing	Service
Agriculture	1,49	0,33	0,38
Manufacturing	1,17	1,96	1,02
Services	0,12	0,08	1,19
Totals	2,78	2,37	2,59

Source: own edition

The example signalizes how sector-specific multipliers are used to obtain a more accurate and detailed estimation of regional economic impacts. It is used to aggregate pilgrim tourism multipliers computed from the "Totals" row of Table 3. **The 2,59 aggregate sales multiplier for services is based upon the idea that any EUR 1 thousand local expenditure by pilgrims, spent for services, leads to a plus EUR 2,59 thousand indirect effect in the region spent by those who received the initial outlay**. For example, if pilgrims pay for catering or to buy goods at a retailer, the entrepreneurs in turn spend their income on goods and services, thus giving employment to additional firms and individuals, etc. This way the original expenditure by the pilgrim visitors circulates repeatedly through the economy, and the total economic activity generated (2,59) is greater than the EUR amount of the original expenditure alone.

The jobs-to-sales ratio shows how the service companies can pay additional income after the increased turnover of sales in the service sector. In the service sector 25% of the total input corresponds with the payment for labor (Appendix II). This ratio readily allows converting sales in a given sector to jobs. The employers spend more money for goods and services, the companies can grow their margins so the consumption increases in terms of additional paid income for household, and so on.

Table 4: The Multipliers II.

	Agriculture	Manufacturing	Retail
Agriculture	1,93	0,72	0,91
Manufacturing	1,99	2,70	2,01
Services	0,37	0,31	1,49
Totals	4,29	3,73	4,40

Source: own edition

The multipliers in Table 4 present sector-weighted services in proportion to their share of direct sales. This shows how the aggregate multipliers depend on the mix of goods and services purchased by pilgrims, and the induced effect of additional final consumption (Dedák, 2010). Employees in the service sector spend their income in Lébény area, thus creating additional sales and economic activity. Type II multipliers (4,40) capture both indirect and induced effects.

For the purpose to determine the total income impact in Lébény area, the anticipated direct net income must be adjusted by an appropriate factor (multiplier) to obtain a final figure which includes both direct (net) and secondary (induced) income impacts, so we can calculate the new GDP numbers (EUR 37,34 million).

5. CONCLUSION

The calculated multipliers are defined as the ration of the change of economic output to change of spending in service sector by pilgrims. It is examined how much the regional equilibrium level of output change when assumed pilgrim spending change. It is nor goal to explain why planned and assumed spending change. The increase in planned corporate performances comes from more pilgrim consumption. The retailers or restaurant inventories decline, so they need to buy ones, in response to decreased inventory suppliers increase output. Output and input cab rise significantly by more than fout times in Lébény region.

However, using this econometric model the effect of retail spending can be quantified as every additional EUR 1 thousand spent by pilgrims in a region (i.e. town) leads to a total economic effect of EUR 4,4 thousand on the sales. For this analysis, the value of the multiplier used for the pilgrim tourism in Lébény is 4,4. This multiplier attempts to take into account the important leakages which occur out of any locality or region in the form of export or imports. The figure of the pilgrimage multiplier is derived detailed in the paper. This implies that the EUR million extra income will generate an increase of EUR 18,22 million in the regional gross domestic product.

The main goal of this research paper is to present the method which can be applicable to examine the multiplier effect on regional level in terms of input – output model. Due to the dominating the analysis in macroeconomic level, excellent research topic is to work out new methods to examine the effect of the demand shock on local economy. The basic conclusion of my research is using the statistical macroeconomic benchmarks to regional analysis provides a useful model for local economic decision makers to evaluate the change of business relationships.

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APPENDIX I

Assumptions	Ratios
Local consumption's total purchasing power	80%
Share of agriculture product consumption	35%
Share of industry products	35%
Share of service purchases	30%
Payments to households for intermediate input purchases	
Agriculture	20%
Manufacturing	30%
Services	40%
Import to consumption	
Agriculture	20%
Manufacturing	50%
Services	15%
Export to consumption	
Agriculture	46%
Manufacturing	37%
Services	45%
Investments to consumption	5%

APPENDIX II

The Transaction Table	Agriculture	Manufacturing	Services	Households consumption	Government spending	Exports	Investments	**Gross Output**
Output produced by								
Agriculture	6,72	8,40	1,68	5,60		7,76	0,28	30,44
Manufacturing	13,44	26,88	4,48	5,60		16,48	0,28	67,16
Services	1,44	1,92	1,44	4,80	-	2,14	0,24	11,98
Payments for								-
Household services	4,32	11,16	3,04	-	0,60	-	-	19,12
Government Services	0,20	0,20	0,20	-	-	-	-	0,60
Imports into the region	4,32	18,60	1,14	-	-	-	-	24,06
Gross input	30,44	67,16	11,98	16,00	0,60	26,38	0,80	153,36