

Reconceptualising Regional Inequalities

The Application of a Modified Philippe Martin Model to the Tourism Sector

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Abstract

Tourism can play a pivotal role in relation to spatial development perspectives, regional processes, and the efficient use of different kinds of resources. It is no different in Central Eastern Europe; tourism frequently plays such a role in Hungary, especially in the case of areas with disadvantaged spatial conditions. In this paper, the effect of tourism on the region as a primary source of income is investigated. The research hypothesis is that Philippe Martin's regional economic model could be modified to describe the spatial effects of tourism. According to the research hypothesis, the methodology of the original and a modified Philippe Martin model is shown in the second part of this paper, and this is followed by the modelling results. In the case of the Hungarian research area, a detailed analysis of statistics is shown. The spatial focus of this paper is on Lake Tisza in Hungary, which has a unique character. On the other hand, it is rich in both natural capital and disadvantaged areas when socio-economic conditions are considered. The research results showed that the predefined scenarios of the Philippe Martin model individually do not correctly describe the effect of tourism, but taken together could explain the economic impacts of tourism. Tourism has the same effect as a combination of monetary transfer from the wealthy regions to the impoverished area, a diminution of transaction costs within the impoverished region, and a slight increase in the cost of innovation or a small decrease in diffusion of innovation.

Keywords

spatial equity, Philippe Martin model, tourism, innovation, regional economic development pathways

1 Introduction

Nowadays, tourism has a unique role not only on a global scale, but also at regional and local levels. In several countries and regions, tourism can be seen as a solution to the problem of how to foster regional development. The regional development pathways can be crucial in moving regions towards sustainability, especially in an era of climate change mitigation and adaptation issues. It can be stated that productivity is a key concept in economics. Increased productivity also leads to increased output and economic growth. The main purpose of tourist destinations is to increase tourism productivity (Liu and Wu, 2019). Tourism is the activity of people who travel to a place other than their home for business, leisure, or other personal purposes. Tourism has started to grow significantly in recent decades (Li et al., 2018). The international significance of tourism is demonstrated by its share of more than 10% of global GDP and 10 billion years of tourism travel worldwide, including nearly 900 million international tourists

(Peeters et al., 2007). Tourism contributes significantly to the economic growth of tourist destinations by improving infrastructure, increasing the number of people employed, and increasing foreign exchange revenue. Regional development is generally seen as a breakthrough outcome. In most cases, tourism is indeed a potential driver of economic growth. However, in some cases, it can also have a negative impact on economic growth; for instance, this may be due to marginal incomes, environmental factors, and ineffective tourism policy (Li et al., 2018). The tourism sector also has a broad impact on other sectors. It has an impact on economic growth and has a long-term causal relationship with infrastructure (Baker et al., 2015). Infrastructure is often seen as a critical factor for the growth of regions. Tourism is an essential factor in the development of infrastructure, particularly in the development of air transport (Percoco, 2010). Continuous development of the regions can be observed (van Leeuwen, 2015).

We distinguish between international and domestic tourism. However, domestic tourism cannot be used for comparative analysis in some countries, for example, Hungary and China (Peeters et al., 2007).

Over the last few decades, the challenges of economic decline have been a serious problem for rural areas around the world (Han et al., 2021). Due to the ageing and emigration of the population, tourism is often believed to be an effective way to stimulate the economy (Carson and Carson, 2018). It therefore plays a vital role in the decision-making processes. Rural tourism improves the quality of life of rural people, stimulating rapid economic growth and creating more jobs (Yang et al., 2021). Tourism is a very sensitive sector, as was demonstrated when it was one of the sectors most affected by the effects of the 2020 Covid epidemic. Tourism investors also invest less when the outlook of the industry is uncertain or risky (Akadiri et al., 2020). The social-cultural and economic perspectives are factors crucial to the transition towards sustainability and in regional tourism development (Szlávik et al., 2016). The tourism sector is the most responsive to geopolitical events, so political uncertainty is also a significant factor affecting the overnight stays of a given tourist destination (Lanouar and Goaid, 2019). These events have a major impact on economic performance and the stock market, as people's feelings have a significant impact on economic decision-making (Drakos and Kallandranis, 2015).

Tourism and recreation are pivotal factors of employment, facilitators and symbols of mobility, and significant sources of environmental impacts of transport (Hall, 2010). Tourism also influences the distribution of income through changes in prices, changes in household income, and it affects public revenues as well (Carrascal Incera and Fernández, 2015). The cost of public capital is often an important factor in economic growth, as output increases with GDP (Percoco, 2010).

Tourism also contributes to economic growth and income for households and local businesses. If low-income households are not involved in tourism, tourism activities will further exacerbate economic inequalities. Based on international and regional experience, tourism has the potential to produce significant positive indirect and direct effects at the local level through increased production and employment rates. In addition, wages and capital gains may also increase. It also has a direct impact on the main tourism-related industries (accommodation, hospitality, transport) and food and beverage products (Carrascal Incera and Fernández, 2015).

The tourism sector is characterised by rapid growth, which creates a high level of competition between tourist destinations. Nowadays, where pandemic restrictions have been eased tourists can travel freely between areas, which increases agglomeration phenomena and impacts beyond administrative borders. They reinforce the functional link between adjacent regions (Comerio et al., 2020). Tourism services are often at odds with sustainability. However, more transparency and the introduction of an appropriate evaluation procedure may provide a solution. The demand for sustainable tourism is likely to increase in the future, which may lead to the development of features such as community travel services, which may also be useful to other traveller segments (Schiefelbusch et al., 2007). Santos and Cincera (2018) conducted a case study in Brussels in 2018 focusing on tourism needs, which showed that tourism needs were best characterised by the number of nights spent. Night tourism accounts for 4.4% of global CO₂ emissions (Peeters and Dubois, 2010). As a source of income, tourism is putting pressure on sensitive ecosystems and communities in many regions. It is a major driver of transport, but the importance of sustainable tourism has often been overlooked (Schiefelbusch et al., 2007). The development of sustainable tourism is a key factor and the pillars of sustainability need to be integrated into investment plans for the tourism sector and in decision making on programs. By using the right set of indicators, the investment alternatives can be selected with sustainability considerations in mind that have a long-term relevant economic policy impact (Nesticò and Maselli, 2020). The current development of the tourism sector is at odds with the policies and objectives of climate change mitigation (Peeters and Dubois, 2010).

Transport infrastructure can also play an important role in tourism in the area highlighted by the study (Brida et al., 2014). Increased tourism travel significantly increases greenhouse gas emissions. According to a study published in 2010, one solution could be the "slow travel" movement. This means that travellers travel fewer distances, and this movement contributes to adaptation strategies by reducing the carbon footprint of tourism. A journey in which not only the destination but also the surrounding area is explored by travellers. During the trip, they usually travel on foot or by bicycle, although tourists can also use other means of transport. With this method of travel, they can have even more experiences (Dickinson et al., 2010).

2 The study area

Leisure activities are becoming one of the most important functions of urban lakes, but not enough research attention is being paid to the pressures of increasing use (Gao et al., 2019). In Central Europe as well as in Hungary, tourism has always played a significant role in the national economy and in regional development processes. Tourism contributes to GDP growth and has generated growth in the hospitality industry, especially over the last 15 years until 2020. In 2020, the Covid epidemic significantly affected the sector's revenue. Lakeside tourism plays a unique role in Hungary's tourism; more than 20% of the guest nights in Hungary spent at the country's four lakeside destinations (Pomucz and Csete, 2015). Thus, the spatial focus of our analyses is related to lakeside tourism. However, the tourism sector is highly concentrated in the capital and Lake Balaton, although Hungary boasts countless natural and cultural treasures. The second largest lake in Hungary is less popular than Lake Balaton, but it is an important tourist centre (Káposzta et al., 2016). As a tourist destination, Lake Tisza offers a very good opportunity for participants of the slow travel movement, especially for domestic travellers. Considering transport accessibility and connectivity, both the level and the quality can be characterised by low performance. The Lake Tisza region ranks last among the Hungarian tourist region in terms of tourism demand. (Dávid and Remenyik, 2011).

Lake Tisza is located in the eastern region of Hungary, in the northern part of the Great Plain, on the southeastern edge of Heves county, on the border of Borsod-Abaúj-Zemplén county, Heves county, and Jász-Nagykun-Szolnok county. Lake Tisza (also known as the Kisköre Reservoir) is Hungary's second-largest lake and the largest artificial lake on the Tisza in the Carpathian Basin. It is a meeting point of especially disadvantaged areas, yet it is a major tourist destination. Its primary source of nutrient water is the Tisza. Its area is 127 km², its longest point is 27 km, and its maximum width is 6 km. The lake is attractive because of the alternation of islands, backwaters, shallow canals, and open water surfaces. The land area on the lake is approximately 43 km², with an average water depth of 1.3 metres and a maximum depth of 17 metres. The most important features are illustrated in the Fig. 1.

Until the 1960s, the area looked very different. Soft wooded forests, gallery forests alternated with fresh, wooded pastures and meadows, backwaters, and extensive orchards, and arable land. It was initially conceived of as having several purposes for the construction of the Kisköre reservoir. Besides controlling the floods of the Tisza, its

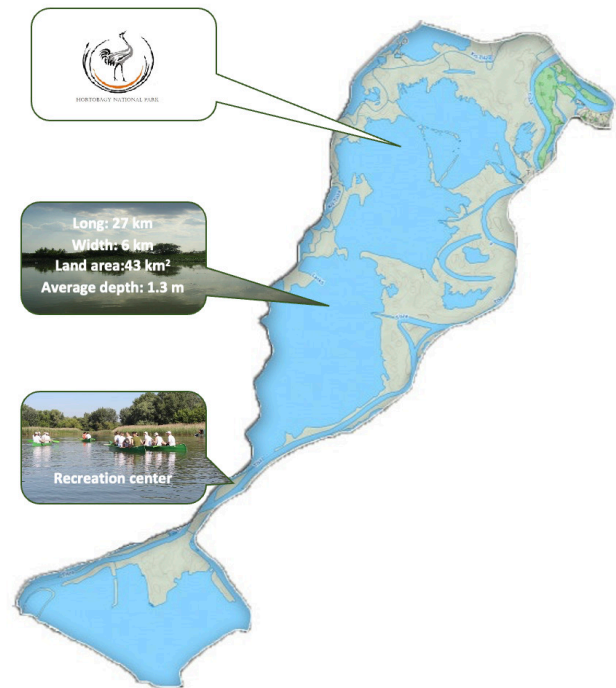


Fig. 1 Lake Tisza

primary purpose was the water supply of the main canals of Jászság and Nagykunság, which plays a significant role in meeting the agricultural water needs. Another main objective is to supply the Kisköre hydroelectric power station with sufficient water, which was designed to provide cheap electricity to the area. In the third row, the aim was to create a suitable place for water sports and maybe interesting from a tourist point of view. The construction of today's dams and the Kisköre power plant began in 1968-69 and with it the deforestation. Since the works would not have been completed in time, before the first damming was started, the only purpose was to cut down the trees and did not deliver. There are still many mud trees and stumps in the area. That makes water transport and sports very dangerous. It is favourable for wildlife and provides nesting and resting places for many birds. The first damming was made possible by the commissioning of the Kisköre reservoir in 1973, and its filling was completed in the 1990s. In the seventies, no one had seen the tourist opportunity in it yet. The possibility of the formation and development of tourism opened new perspectives for one of the most disadvantaged regions of the country at that time. The emergence of previously unknown guest traffic encouraged the establishment of accommodation facilities in the settlements and the launch of various services, which has now become an economic interest. In 2017, together with Debrecen, Hajdúszoboszló and Hortobágy, the government

raised Lake Tisza to the list of priority tourism development areas as a focus area that can be confirmed on the demand and supply side, which includes the ability to make significant domestic and generate international interest (Aranyné Rózsavári et al., 2018). The Lake Tisza area can be described with spatial diversity including different living spaces, landscapes, recreation-related activities, etc.

The lake has developed its ecology by today; it also has a bird reserve not only for ornithologists and it is rich in natural heritage. Since 1999 it has been a UNESCO World Heritage Site as a demonstration area of the Hortobágy National Park.

Based on the article of Tamás Várhelyi in 2019, it can be said that the larger-scale tourism success of Lake Tisza can only be achieved with the help of complex developments, which have four key elements. The four key elements are accessibility, unique tourism developments, port and beach development, and modern tourism marketing development (Várhelyi, 2019).

Considering the challenges of climate change as an influencing factor of regional pathways and based on the vulnerability assessment of the nine Hungarian tourism region (Csete et al., 2013), it can be seen that for

example the most significant lake, which is Lake Balaton has medium vulnerability (higher exposure with relatively good adaptive capacity) and compared to this, Lake Tisza is more vulnerable (higher exposure and weak adaptive capacity) mainly due to the socio-economic conditions of the examined area. Their main attraction, the water-related lake, and river tourism is the most vulnerable tourism supply type in both cases (Fig. 2).

In this paper, the authors investigate the effect of tourism on the region as the primary source of income. Thus far, only some investigation has done basically on sustainable tourism (Csete, 2010; Rátz and Vizi, 2004), on tourism (Jankowska et al., 2014; Remenyik et al., 2013; Stasiak-Betlejewska et al., 2016), on water-based tourism (Vasvári et al., 2015). Until now, very little is known about the effect of tourism on the complex economic performance of the region.

The research hypothesis is that Philippe Martin's spatial economic model could be modified to describe the regional effect of tourism. The authors have found that the predefined scenarios of Philippe Martin individually do not correctly describe the effect of tourism, but their combination could describe the economic effect of tourism. In the

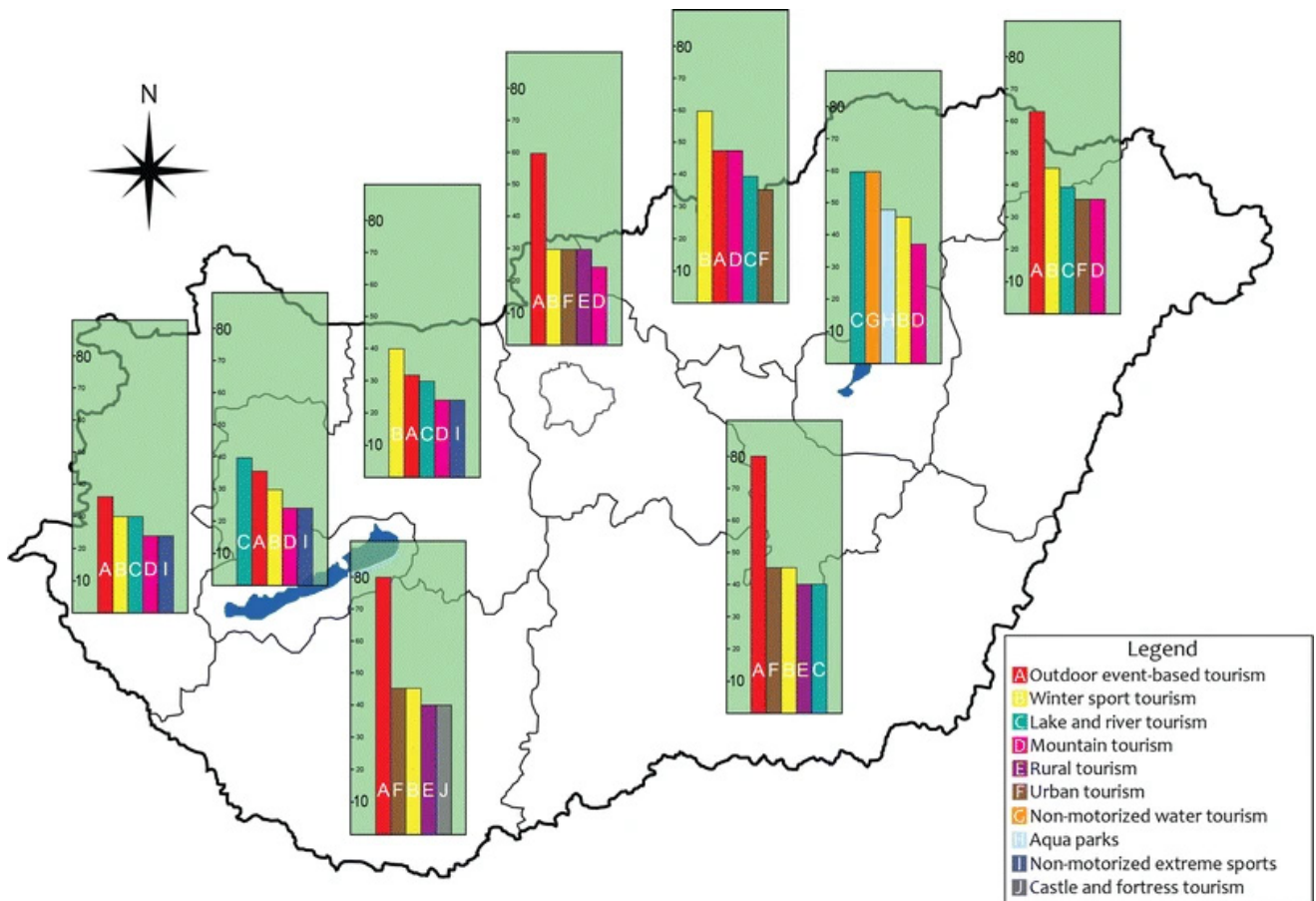


Fig. 2 The vulnerability map of Hungarian tourism regions (Csete et al., 2013)

next part, the methodology of the original and modified Philippe Martin model is shown and then the results of modelling are described. In the last section, a detailed analysis of statistics is shown. Finally, the conclusion is drawn.

3 Material and methodology

The new theories of economic geography and endogenous growth can serve as a conceptual framework for spatial development and regional policies since they offer explanations for self-sustaining phenomena of regional inequalities. To illustrate this tension between the countervailing effects of agglomeration – positive in terms of efficiency but potentially harmful in terms of equity – Philippe Martin (1999) used a two-region theoretical scheme.

Firms can locate either in the capital-rich region or in an impoverished region. The geographical concentration of firms in the wealthy region increases when transaction costs between the regions fall. The logic behind this is that it is always more profitable to produce in the more prosperous area, the broader market, to maximise the benefits of economies of scale. When transaction costs between the regions fall, businesses can then exploit these economies of scale while also selling on the "small market", which is less "protected" by high transaction costs. In addition, when regional inequality in terms of income increases, regional disparities in terms of the spatial distribution of firms (industrial agglomeration) likewise increases, since economies of scale give firms an incentive to locate where demand is most substantial and income consequently highest. Equilibrium geography is such that the profits of businesses are identical in both regions, which eliminates any incentive to relocate (Martin, 1998). In this system, there are different equilibrium relationships. The spatial equilibrium shows where income inequalities and industrial agglomeration are determined. It shows that the phenomenon of agglomeration tends to increase when income inequalities increase because firms locate in markets with high purchasing power. Also, Philippe Martin stated that when industrial agglomeration increases competition intensifies, thereby tending to reduce the profits of monopolistic businesses and income inequality between regions.

The spatial equilibrium, in turn, influences the rate of innovation. It shows a positive relationship between innovation and agglomeration due to the existence of localized spill-overs. Philippe Martin (1999) investigated three pre-defined scenarios in his model:

- Simple monetary transfer from the wealthy region to the impoverished region. The induced effect on the geography will be to weaken the agglomeration

phenomenon since the increase in incomes in the impoverished region (and the diminution of income in the wealthy region) will stimulate relocation of firms to the region that has relatively increased its purchasing power. In the lower part of the graph, this decline in agglomeration is reflected in a more dispersed economic geography less conducive to spill-overs, and a lower growth rate.

- Diminutive transaction costs within the impoverished region. Industrial agglomeration has diminished to the benefit of the impoverished region, leading to a lower rate of innovation and greater income inequality as businesses in the wealthy region would face less competition to increase their profits. This example may seem paradoxical, but it highlights the fact that industrial location inequality does not always exactly mirror income inequality since economic geography has an impact on the rate of innovation that can itself influence income inequalities.
- Effect of a reduction in the cost of innovation or an increase in the diffusion of innovation. Another policy, closer to the traditional vision of regional policies, can also have the same effects. As has been seen, infrastructural policies that reduce the inter-regional or intra-regional cost of good sled either to unequal geography or to a decline in the rate of innovation. However, when infrastructure-improvement policy focuses on lowering the cost of conveying information technology rather than the cost of transporting goods, the effect is quite different: by fostering the impacts of inter-regional spill-overs, such a policy enables the rate of innovation for a given geography to be stepped up since the innovation sector benefits more from spill-overs generated by geographically remote firms. These policies would have the objective of increasing the capacity of poor regions to absorb new technologies and increase spatial diffusion of innovation.

With the help of the described model, we study the tourism of Lake Tisza, and in our model guest nights are taken into account instead of the degree of agglomeration.

4 Analyses

In this section, the authors cover the statistics needed for the calculation. The most important data used here are the relationship between domestic and foreign guest nights, wages, and innovation. The necessary data were provided by the HCSO (Hungarian Central Statistical Office) and the Eurostat databases.

Innovation is the ratio of gross domestic R&D expenditure to gross domestic product. The value of innovation was provided by the Eurostat database for years, while wages and guest nights were obtained from the HCSO database in the study area.

To be able to analyse the effect of tourism on the regional level, the Philippe Martin model was modified. The agglomeration ratio was not based on the number of firms, but the number of apartments and hotels and their provided services described by guest-nights. The Hungarian Statistical Office provided the data. Descriptive statistical tools were used to analyse the results of the modified Philippe Martin model.

Firstly, the effect of domestic tourism was analysed (Fig. 3).

As can be seen in Fig. 3 none of the predefined scenarios of Philippe Martin describes the effect of domestic tourism. However, domestic tourism has the same effect as a combination of monetary transfer from the wealthy region to the impoverished region and diminution of transaction costs within the impoverished region.

The number of nights spent by domestic tourists and innovation was the highest in 2017 as well, but the wages were the highest in 2018.

Secondly, foreign tourism was analysed (Fig. 4).

As shown in Fig. 4. none of the predefined scenarios of Philippe Martin describes the effect of foreign tourism

clearly. However, foreign tourism has the same effect as a combination of monetary transfer from the wealthy region to the impoverished region and an increase in the cost of innovation or a decrease in diffusion of innovation.

The number of nights spent by foreigners and the wages was the highest in 2018, while the rate of innovation was in 2017.

Thirdly, the total tourism was summed up and analyzed (Fig. 5).

As shown in Fig. 5 none of the predefined scenarios of Philippe Martin describes the effect of tourism exactly. However, tourism has the same effect as a combination of monetary transfer from the wealthy region to the impoverished region and diminution of transaction costs within the impoverished region and a small increase in the cost of innovation or a slight decrease in diffusion of innovation. The Figs. 3 and 4 show that in 2016 and 2017, the level of innovation was the same and the number of guest nights was different. Still, Fig. 5 is different from what we expected. The data were provided by the HCSO database. In Fig. 5, the wages were the highest in 2018, but the innovation and the number of guest nights were the highest in 2017.

The reason for this can be seen in Table 1.

If only innovation were to be analysed, then in 2016 and 2017 the rate of innovation was the same. If only the percentage of innovation is considered, it can be stated that Hungary in 2015 spent more on innovation than in 2018,

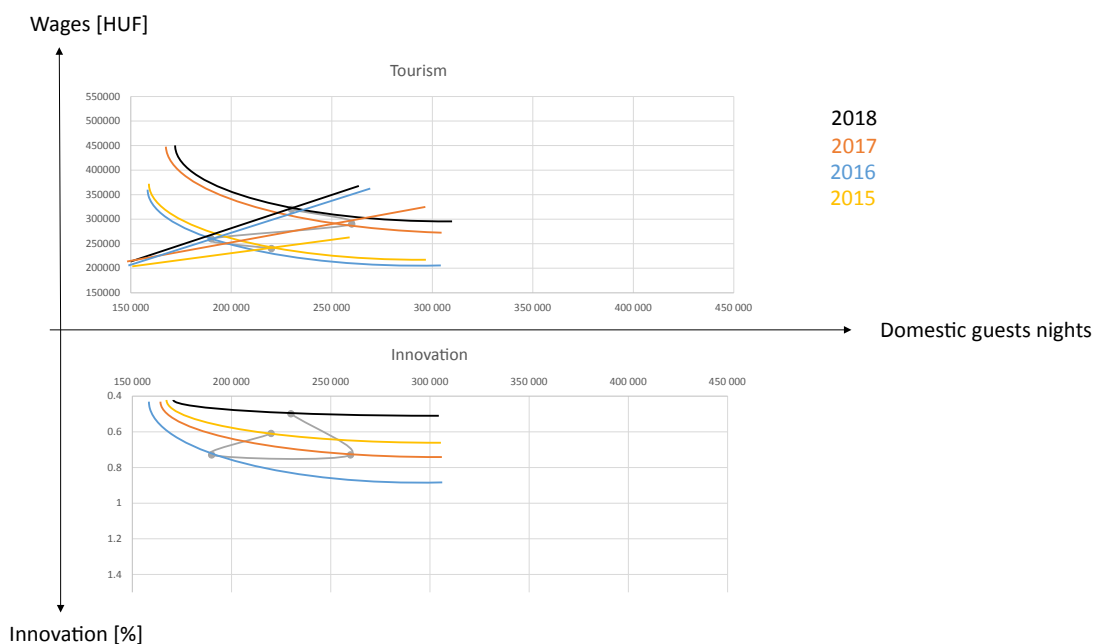


Fig. 3 Modified Philippe Martin model for domestic tourism (based on Eurostat and HCSO)

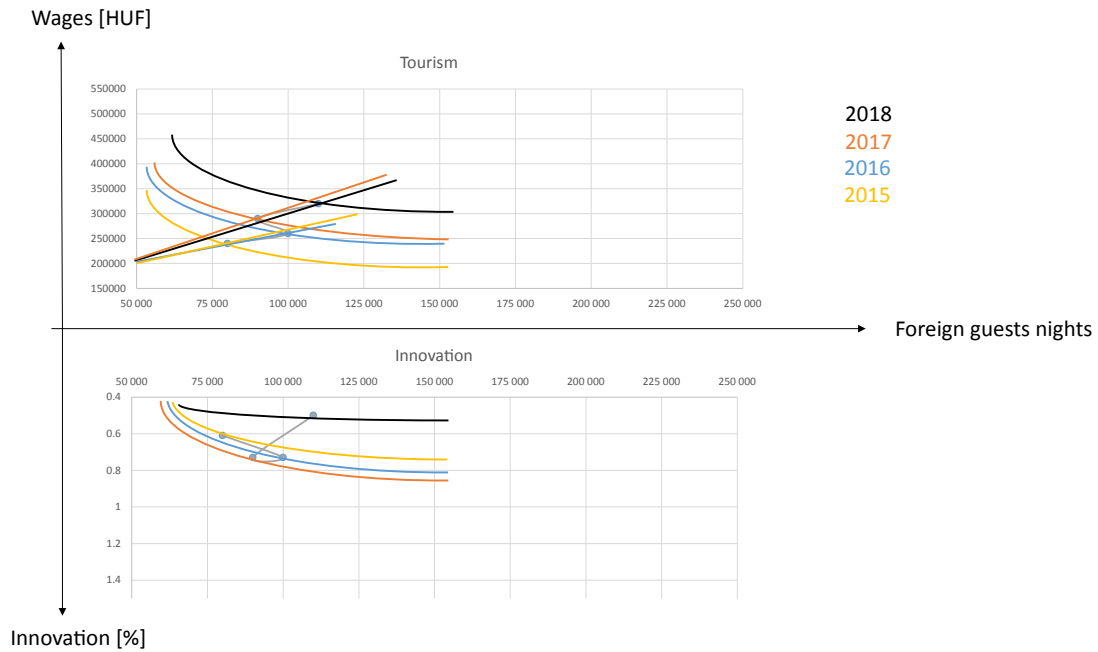


Fig. 4 Modified Philippe Martin model for foreign tourism (based on Eurostat and HCSO)

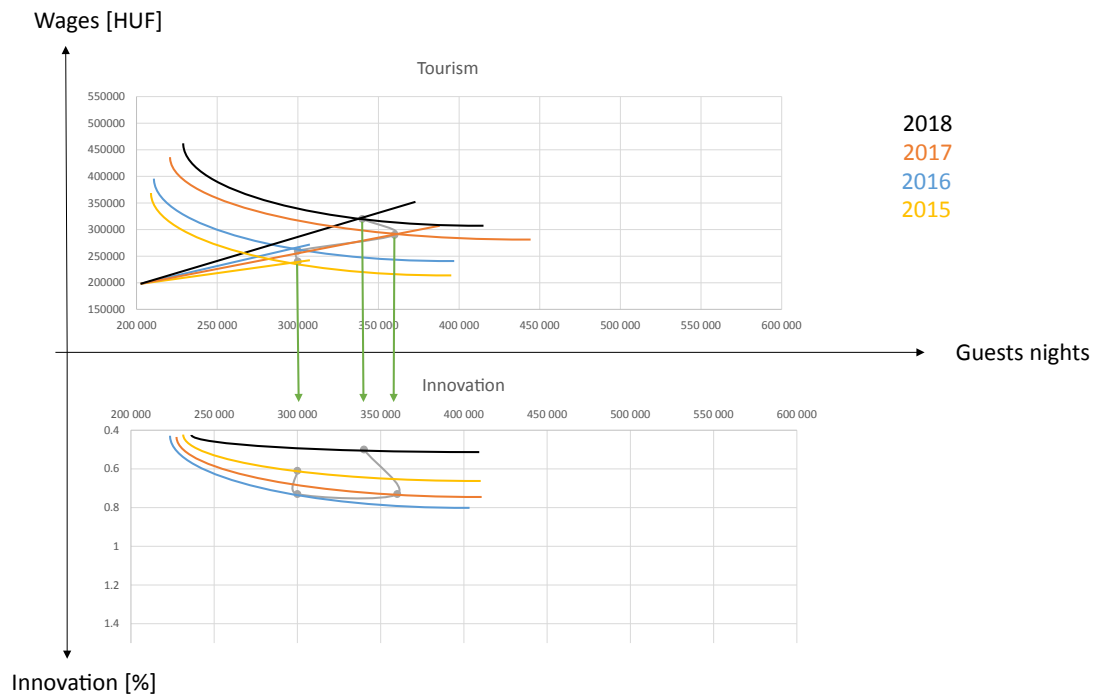


Fig. 5 Modified Philippe Martin model for tourism (based on Eurostat and HCSO)

Table 1 The connection between GDP and innovation

Year	GDP [billion HUF]	Innovation [%]	Value of innovation in absolute value [billion HUF]
2015	34,785.2	0.61	212.1897
2016	35,896.3	0.73	262.0429
2017	38,835.2	0.73	283.4969
2018	42,661.8	0.5	213.309

as 0.61% of GDP in 2015 and 0.5% in 2018. However, if both Fig. 5 and Table 1 are examined, it can be seen that in absolute terms Hungary spent more on R&D in 2018 than in 2015, and in 2016 and 2017, there were more guest nights. This explains the shape of the cumulative curve because innovation has an impact on guest nights.

5 Results and discussion

The tourism sector can contribute to the local economy through added value. Based on the Philippe Martin model firstly, wages, guest-nights, and innovation were investigated.

Firstly, the rate of employment was evaluated between 2015–2018 on monthly bases (Fig. 6).

Fig. 6 also shows that as wages increase, the number of employees increases. Secondly, the guest nights were investigated between 2014–2018 on monthly bases (Fig. 7).

The time analysis led to the question of whether there is a correlation between domestic and foreign tourism performance. Hence, a regression analysis was done (see Fig. 8). As can be seen, there is a connection between domestic and foreign guest-nights.

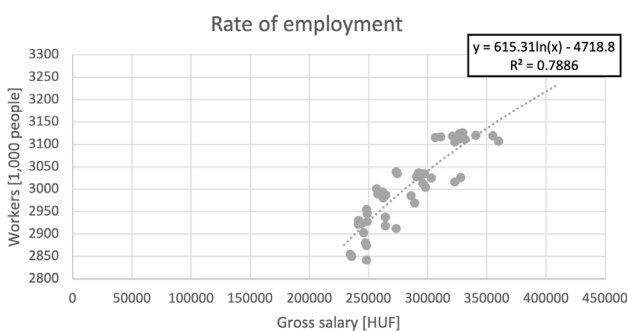


Fig. 6 The connection between gross salary [HUF] and number of employed persons (based on HCSO)

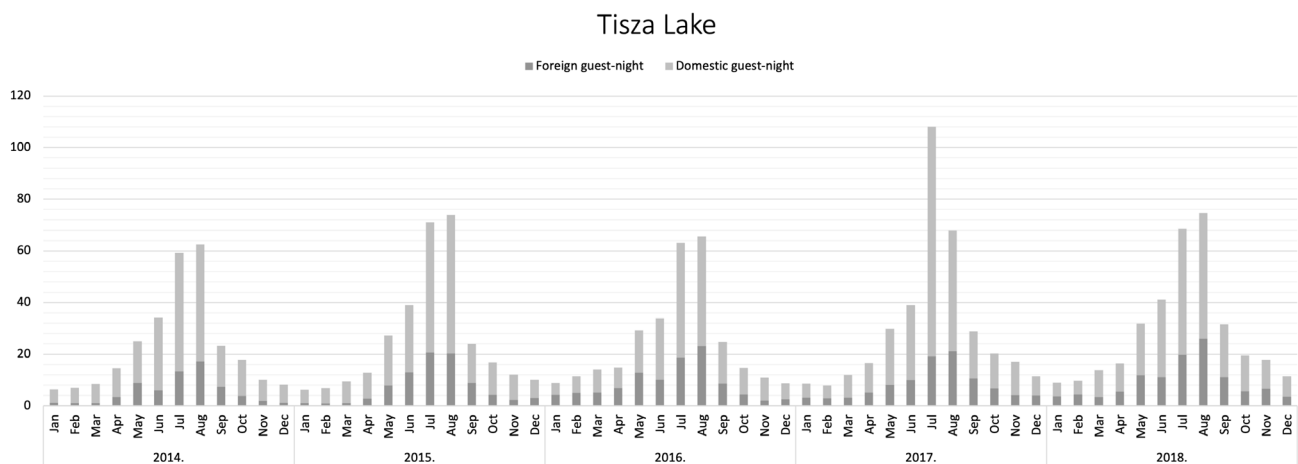


Fig. 7 The time series of guest domestic and foreign nights (based on HCSO)

6 Conclusions

Due to the rich surface and underground water resources, water-based tourism belongs to the most attractive tourism type in Hungary, depending on spatial characteristics. The development potential of the tourism-related spatial characteristics of Lake Tisza is still unexpected; the low price-quality ratio makes this region attractive in terms of tourism. This tourism destination is an internal periphery in Hungary at the same time.

Results show that Philippe Martin's spatial economic model could be modified to describe the regional effect of tourism. A modified Philippe Martin model was investigated in a unique tourism destination with special natural capital and disadvantageous socio-economic spatial characteristics in Hungary. In those regions where tourism is developed, it can lead to more intense environmental awareness that can also enhance to be able to move towards a sustainable and climate-conscious spatial planning.

As per the Philippe Martin model wages, guest-nights and innovation were analysed from the perspective of the regional impacts of tourism-related spatial development. Individually, the predefined scenarios do not describe the effect of tourism at the regional level correctly. However, the combination of those scenarios can be used to describe the regional or local economic impact on tourism, taking spatial characteristics into account.

Tourism has the same effect as a combination of monetary transfer from the wealthy region to the impoverished region, a diminution of transaction costs within the impoverished region and a small increase in the cost of innovation or a slight decrease in diffusion of innovation. In future, more detailed spatial statistical analysis is requested, making further use of spatial economics.

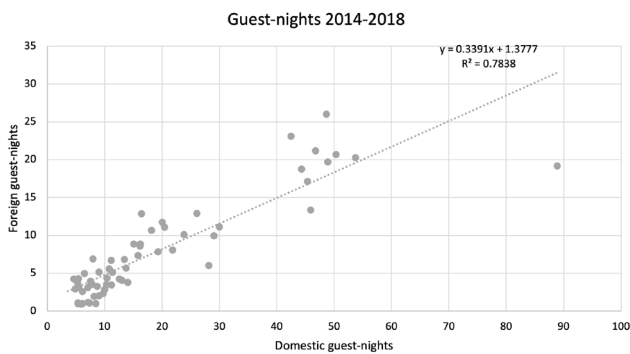


Fig. 8 Regression of guest domestic and foreign nights (based on HCSO)

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