materiały z badań

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REGIONAL ECONOMIC IMPACTS OF FISHING AND HUNTING IN FINLAND

Abstract: The state enterprise, Metsähallitus, administers state-owned land and water areas in Finland covering approximately 12 million hectares. One of the official administrative duties of Metsähallitus is to provide hunting and fishing opportunities for citizens. In 2013, more than 81,000 hunting licenses and 71,000 fishing licenses were granted. As indicated in the study, during one season, Metsähallitus hunting and fishing customers spent over EUR 33 million in the region for where the licenses were issued. This paper indicates that hunters and fishers in Finland travel extensively and support the regional economy with their expenditure. In the summer and autumn of 2013, Metsähallitus carried out a survey that provided valuable and up-to-date information that could be used for quantitative and qualitative research. For modelling purposes the private expenditures of hunters and fishers were grouped into categories: trade, accommodation, restaurants, local public transport, and entertainment. However, the study also analysed these expenditures in more detail, presenting the personal expenditures per trip, per day of a trip, and per license. Moreover, the location of the expenditures was disaggregated into the region for where the license was issued, the region of residence, and "on the way" between those two. For example, an average grouse hunter with short-time period (1–7 days) license in 2013 spent around EUR 150 per hunting trip within his or her own region of residence, and more than EUR 440 per trip if the hunting area was located outside the region of residence.

RegFin, a comparative-static regional Computable General Equilibrium (CGE) simulation model was used in this study to calculate the wider economic impacts of these direct expences at a regional level, as well as to serve as an engine for an Excel-based assessment tool. The assessment of the regional economic impacts focused on basic economic indicators such as regional gross domestic product (GDP), private consumption, and employment.

The results of the study indicate that hunting and fishing activities have a positive impact on regional economies. Consideration of licenses in 2013, hunting and fishing on state-owned land show that they increased regional GDP by EUR 7 million, created 86,5 person working years, and produced private consumption of EUR 36.7 million.

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Among the many conclusions, it was found that investments in regional services linked to hunting and fishing activities would increase the regional economic impact of Metsähallitus customers.

Key words: Regional economic impacts, CGE modelling, hunting tourism, recreational fishing, nature based tourism

INTRODUCTION

Metsähallitus is a state-owned enterprise with both business and public administrations. It administers state-owned land and water areas in Finland covering approximately 12 million hectares, with one of its core activities being to manage and use these areas for the benefit of the greater Finnish society, and to support business opportunities.

Hunting and fishing opportunities on the state-owned land are managed by the authorized sales of licenses. All activities must be environmentally and socially sustainable. Ecological sustainability means that the game or fish stocks cannot be overused, and social sustainability stands for the equal treatment of customers and taking into the account needs and perceptions of the key stakeholders.

In 2013, more than 150,000 hunting and fishing licenses for state-owned land were sold in Finland. The regional distribution of the sales is presented in Table 1. As indicated in the paper, Metsähallitus customers travel extensively and spend a significant amount of money on, inter alia, accommodation, daily goods, fuel and services. Assessment of the pattern of expenditures and their regional economic impacts is the key focus of the study.

Previous studies have focused on particular areas or regions (Matilainen & Keskinarkaus, 2010). For example, in 2009, the regional economic impacts of small game hunters in Eastern Lapland were evaluated (Keskinarkaus, Matilainen & Kurki, 2009). This paper, based on the *Evaluation of Regional Economic Impacts of Hunting and Fishing Customers of Metsähallitus*-project, financed by Metsähallitus and the Finnish Ministry of Agriculture and Forestry, is the first attempt to evaluate fully the regional economic impact of all types of hunting and fishing activities on the whole country.

This study presents the regional differences in customers' behaviour and the regional economic impacts of fishing and hunting in Finland. The research team has created an innovative Excel-based evaluation tool for impact analysis for the Metsähallitus.

METHODOLOGY AND METHODS

Definitions

Concept	Explanation
1	2
Tourist hunter/fisher	A respondent who went hunting or fishing outside the region of residence
Regional hunter/fisher	A respondent who went hunting or fishing within the borders of the region of residence
License type	Metsähallitus sells different types of hunting and fishing permits e.g. grouse hunting license, moose hunting license, bear hunting license, recreational fishing license

1	2
Region of license destination	A NUTS 3 region where the license is valid
Region of residence	A NUTS 3 region of the current residence of a respondent, the set-off region of tourist hunter or fisher
CGE model	Computable General Equilibrium model
Modelling shock	A change in economic conditions (in this case, the hunters' and fishers' impact via expenditures in private consumption)
Regional GDP	Regional gross domestic product (Regional GDP = private consumption + investments + public consumption + exports – imports + trade and transport margins + change in inventories
Direct impact	The impact that the action has on the core sector
Indirect impact	The impact that occurs in sectors, which either serve the core sector or are its customers. This impact flows down and up stream of the core sector's whole value chain.. The concept originates from input-output studies.
Induced impact	The impact that occurs when the direct and indirect impacts will drive the income formation and consumption. The concept originates from input-output studies.
Multiplier impact	The sum of the indirect and induced impact; here calculated as difference between total and direct effects
Total impact	The sum of the direct and multiplier impacts

At the first stage of the study, a detailed, online questionnaire[2] was sent to Metsähallitus customers. The questionnaire was sent in total to more than 10,000 recipients regarding fishing licenses and about 25,000 recipients regarding hunting licenses. The collected answers created a database of more than 8,000 observations; including nearly 2,000 based on issue of fishing licenses. A group of about 55,000 hunters could not be reached due to the § 8 of the Hunting Act, giving the permission to hunt within the home municipality without buying a license. Therefore in this study, only fishers and hunters approached with the questionnaire create *the population,* and all those who responded to it create a random *sample*. With the level of confidence at 95% and the tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk tests), approved this hypothesis for smaller samples but not for the larger ones. The research team has decided that the descriptive analyses will represent the sample level using frequencies distribution. The assessment of the regional economic impacts have been based on the average expenditures calculated per one license in the license destination region, extended to the population.

Division of the types of licenses, used in the descriptive analyses, starts with a type of activities; hunting and fishing. Depending on the game, a Finnish hunter can choose to hunt small or big game. Furthermore, the small game hunting licenses are divided into short-term, lasting from 1–7 days, and seasonal licenses. The study presented short-term small game licenses divided into grouse hunting licenses and waterfowl hunting licenses. In case of seasonal licenses, these two types are linked under the general name of small game seasonal licenses. Big game hunting licenses are always seasonal and the study presents in detail results for moose hunters and bear hunters. Results for fishing licenses focus on recreational fishing, with an over representation of Lapland in the study (more than 60% or all received answers).

[2] The detailed description of the questionnaire and sampling process is described by Sarajärvi (2014).

Part of the questionnaire has been used as a basis for a descriptive analyses focused on hunting and fishing trips, presenting their destination, the main purpose, travelling time, accommodation, company etc. Important information collected from that part of the data was the average amount of bought licenses per one trip in case of short-term licenses (including fishing licenses), and the amount of trips done during the seasonal licenses. Those averages were later used to calculate the average expenditures per license.

In order to fit the results to the economic calculations and the CGE model, official NUTS 3 administrative regions were used. An important approach in the study was to divide all hunters and fishers into tourists and regional inhabitants, as their differences in behaviour as well as the average costs of hunting or fishing trips has been proven to be significant.

At the second stage, a considerable number (150) of simulations were designed and run by the regional CGE RegFin model (Törmä & Zawalinska 2010, 2011, and Törmä et al. 2010). Simulations were carried out for each NUTS 3 region with Metsähallitus' presence by varying the amount of hunters' total expenditures around the level recorded in the survey. The simulation results for the region's GDP, private consumption and employment where then treated as observations in an econometric analysis. For each variable, an econometric model was fitted with the relative change of the expenditure shock, and its second power as explanatory variables. Interaction variables with region-dummies and the expenditure shocks (also in second power) were tested as well. It turned out that only the interaction variables for Lapland region with the largest number of visitors had explanatory power.

Finally, an Excel-based tool was created allowing regional economic impacts assessment in case of changes in licenses sales in the future. The changes in number of licenses and amount of expenditures per license produce an aggregate change in private consumption, which serves as the size of shock (expressed as per cent of base-year regional GDP) for the estimated impact equations, which are non-linear by nature and thus imitate well the original CGE results.

RESULTS AND DISCUSSION

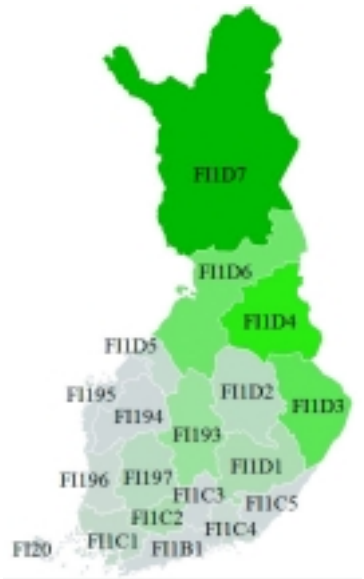
Descriptive analyses

As most of the results are presented at the regional level, Table 1 includes informative map of Finland presenting the region at the NUTS 3 level and the distribution of both fishing and hunting licenses sales.

Analysing the results of descriptive elements based on frequency distributions, there were two main approaches; to compare the findings for the different type of licenses; and to present the regional differences.

The conducted study indicates, that there are several important behavioural differences among all small game hunters. The first and most important difference is that grouse hunters with short-time license (from 1 up to 7 days) travel most extensively among all small game hunters. Small game hunters with seasonal licenses travel visibly shorter distances compared to the short-term licenses owners,

TABLE 1. Regional distribution of hunting and fishing licences sales in 2013
TABELA 1. Regionalna dystrybucja licencji myśliwskich i wędkarskich w 2013 r.



NUTS Code	Name of the region	Share of license sales
FI193	Central Finland	6.1 %
FI194	South Ostrobothnia	0.5 %
FI195	Ostrobothnia	0 %
FI196	Satakunta	0.3 %
FI197	Pirkanmaa	2.7 %
FI1B1	Helsinki-Uusimaa	0 %
FI1C1	Finland Proper	1.4 %
FI1C2	Tavastia Proper	4.0 %
FI1C3	Päijänne Tavastia	0.3 %
FI1C4	Kymenlaakso	0.4 %
FI1C5	South Karelia	0 %
FI1D1	Souther Savonia	4.1 %
FI1D2	Northern Savonia	2.8 %
FI1D3	North Karelia	12.9 %
FI1D4	Kainuu	18.7 %
FI1D5	Central Ostrobothnia	1.1 %
FI1D6	North Ostrobothnia	10.9 %
FI1D7	Lapland	33.8 %
FI20	Aland Islands	0 %
	FINLAND	100%

and they have the lowest share of tourist hunters among them (53%). Also the small game seasonal licenses owners are more likely to travel alone. Finally, an owned cottage or a rented cottage are the two most common choices of accommodation among all small game hunters; with the note that only hunters with grouse hunting license (short-term) choose the rented cottage as the first choice, increasing the average costs of the trip.

Analysis of the different types of big game hunters has shown they are more similar within the group types than small game hunters among them. An average a moose hunter only hunts slightly more often during the season when compared to a bear hunter. Big game hunting is, without a doubt, a social activity, with the smallest share of single hunters among all studied activates. Additionally moose hunting, due to a typical group arrangement, represents the most numerous of hunting trips. Bear hunting trips are on average longer than any other hunting trips, as well as having participants spend a longer time travelling to the license destination region, which is assumed to be connected with other recreational activities on the way. Among all different types of hunters, both big game hunters have a noticeably longer overnight stay in the license destination region.

Among all fishers with the licenses valid in Lapland, the most represented region in the study, 20 %, come from Uusimaa, the capital region. This share is only slightly smaller than the share of regional fishers, who in Lapland constitute of 21 % of the total. Geographical distribution shows fishermen travel all across the country in order to fish, which noticeably increase the fishermens' personal costs.

TABLE 2. Summary of the results of descriptive analyses of the data
TABELA 2. Podsumowanie wyników analizy opisowej danych

	Short-term licenses		Seasonal license			Fishing licenses
	Grouse hunters	Waterfowl hunters	Small game hunters	Moose hunters	Bear hunters	Recreational fishers
Share of men in %	97 %	95 %	97 %	97 %	98 %	93 %
The most common age groups	45-64 years old (45%)	45-64 years old (46%)	45-64 years old (57%)	45-64 years old (60%)	45-64 years old (52%)	25-44 years old (48%)
The most common region of residence	Uusimaa (20%)	North Ostrobothnia (19%)	Northern Savonia (19%)	North Ostrobothnia (25%)	Northern Savonia (15%)	Uusimaa (17%)
The most common region of license destination according to the official sales	Lapland (30%)	Central Finland (18%)	North Karelia (35%)	Lapland (43%)	Reindeer herding area* (56%)	Lapland (37%)
Main aim of the trip	Hunting activities (78%)	Hunting activities (65%)	Hunting activities (77%)	Hunting activities (85%)	Hunting activities (82%)	Fishing activities (56%)
Share of tourists in %	73 %	60 %	53 %	59%	63%	72 %
Average number of licenses per trip (short term only)	1,3	1,3	–	–	–	1,4
Average number of trips per license (seasonal only)	–	–	2,6	2,5	2,3	–
The most common length of the journey in km	101-500 km (34%)	101-500km (44%)	101-500km (52%)	101-500km (44%)	101-500km (57%)	101-500km (31%)
The most common length of the trip in days	1 day and 3 days (16%)	1 day (35%)	1 day (36%)	1 day (24%)	4 days, 5 days and 9-14 days (14%)	1 day (25%)
The most common type of accommodation	Rented cottage (34%)	Own cottage (25%)	Own cottage (35%)	Own cottage (31%)	Rented cottage (25%)	Rented cottage and own accommodation (e.g. tent) (28%)
Share of those travelling alone in %	17 %	20 %	36 %	11 %	12 %	13 %
The most common number of travellers	2 persons (35%)	2 persons (38%)	1 person (36%)	More than 7 persons (40%)	2 persons (23%)	2 persons (40%)
The most common accompanying person	Friends (60%)	Friends (55%)	Friends (44%)	Friends (72%)	Friends (80%)	Friends (52%)

* Lapland, North Ostrobothnia and Kainuu

Analysing the descriptive results from the regional perspective gives clear picture that the northern parts of Finland (Lapland, North Ostrobothnia and Kainuu) are far more popular and attractive destinations than any other regions in Finland. Two of the small game hunts (seasonal and waterfowl hunts) are the exception, where the most common destination is other than Lapland. Among the tourists, small game hunters and recreational fishermen most often live in the south or central part of Finland, whereas big game hunters are more likely to be residents of the northern parts of the country. For extensive hunting and fishing trips (with a duration of two weeks or more) Lapland and Kainuu are always the most common destination, in some cases having the 100% of participants.

The longer the length of the trip to hunting or fishing area, the higher chance that hunters will take part in other activities along the way. Some of the respondents are likely to acquire more than one license type per one trip. This can be expected to occur, for example, within the reindeer herding area, where the moose hunters additionally acquire a bear hunting license.

Important results of the study are presented in form of average expenditure of the Metsähallitus customers calculated in total per trip, per license and per day. The descriptions of the trip length, overnight stay, aim, etc. are reflected in these average expenditures. For example, it is clearly visible that the longer distance to the license destination region, the higher the petrol expenditures.

TABLE 3. Averages of total personal expenditures
TABELA 3. Średnie wartości całkowitych wydatków osobistych

		EUR per person per trip		EUR per person per license		EUR per person per day	
		Tourists	Regionals	Tourists	Regionals	Tourists	Regionals
Short-term licenses	Grouse hunters	443 €	156 €	341 €	114 €	81 €	58 €
	Waterfowl hunters	308 €	96 €	220 €	79 €	73 €	49 €
Seasonal license	Small game hunters	358 €	152 €	830 €	471 €	71 €	67 €
	Moose hunters	544 €	264 €	1144 €	826 €	99 €	61 €
	Bear hunters	579 €	382 €	1409 €	853 €	92 €	71 €
Fishing licenses	Recreational fishers	547 €	139 €	378 €	105 €	82 €	57 €

On average, 70% of the expenditure, presented in Table 3, of tourists is located in the license destination region, 10% is located in the region of residence and the remaining 20% on the way between them. As for the regional residents, 100% of all expenditures are located in the license destination region that is the same at the region of residence.

In the average total personal expenditure there are three main cost items; food and groceries, petrol and accommodation. These three cost items for all types of licenses constitute between 80–90% of total expenditures. The remaining share of costs consists of; coffee and restaurants, local transportation, hunting or fishing services and other amusement services.

Regardless the type of obtained license, there is a visible difference between costs of tourists and regionals. One of the reasons for this is that regional hunters and

fishers travel shorten distances; also more often the trips are only one day long, without an overnight stay.

CGE MODELLING

Average expenditures located in license destination regions, mapped to service sectors: trade, land transportation, accommodation, restaurants and entertainment were calculated based on the samples. Based on Metsähallitus databases, an official proportion between tourists and regionals was estimated; also an official licenses sales in 2013 were collected. Finally, by combining all those data, an expenditure consumption pattern of tourists and residents was created.

The sum of expenditures of tourist hunters in 2013 in the licenses' regions exceeds EUR 17 million while regionals spent nearly 7.5 million. Tourist fishers left in the licenses' regions more than EUR 7.5 million and the regionals spent about 1.7 million.

Based on above data, 150 alternative simulations were run by using the CGE RegFin model (see Appendix 1 for general description of the model) for a range of total sectoral expenditures fluctuating around the observed mean expenditures from the survey, giving the range of possible evaluation results of regional economic impacts. These results were utilised in the creation of the Excel-based evaluation tool.

TABLE 4. Regional economic impact of hunting and fishing; regional GDP and private consumption
TABELA 4. Wpływ myślistwa i wędkarstwa na gospodarkę regionalną; PKB wg regionów i konsumpcja prywatna

		Change in regional GDP, EUR	Change in private consumption, EUR	Change in employment, person-years
	Direct impact of the money used	Total impact	Total impact	Total impact
		Hunting		
Lapland	10 901 308 €	2 418 334 €	11 959 488 €	31,2
Kainuu	5 646 205 €	1 130 133 €	6 202 107 €	14,1
NorthOstrobothnia	3 287 944 €	653 352 €	3 598 444 €	6,9
Central Ostrobothnia	332 683 €	68 716 €	364 033 €	0,7
Central Finalnd	571 472 €	114 942 €	625 254 €	1,2
North Karelia	2 489 823 €	496 556 €	2 726 293 €	6,1
Pirkanmaa	345 743 €	73 560 €	378 255 €	0,7
Other	588 137 €	117 800 €	643 447 €	1,3
HUNTING TOTAL	**24 163 315 €**	**5 073 393 €**	**26 013 733 €**	**62,2**
		Fishing		
Lapland	5 412 720 €	1 193 507 €	5 929 764 €	15,3
Kainuu	1 341 185 €	263 101 €	1 468 676 €	3,2
North Ostrobothnia	602 013 €	119 371 €	658 651 €	1,3
North Karelia	847 381 €	168 347 €	927 316 €	2,0
Other	1 079 700 €	219 914 €	1 181 250 €	2,5
FISHING TOTAL	**9 282 999 €**	**1 964 240 €**	**10 165 657 €**	**24,03**

First, the size of the change in economic conditions was evaluated. This defined the shock value on private consumption and was based on the before mentioned expenditures or the direct effects. The total changes in private consumption due to

The regional economic impacts of Metsähallitus customers

Note: cells coloured: are changeable by the user

Choose from the list	Region's code	Region's name	Name in the model	Index no.
Region:	MK19	Lapland	Lapland	15

	Sold licenses in 2013		New sold licenses		License type available in the region?		Change, %	
License type	Regional	Tourist	Regional	Tourist	Regional	Tourist	Regional	Tourist
Fishing	5 248	18 390	5 248	18 390	Yes	Yes	0	0
Grouse	1 579	10 775	0	0	Yes	Yes	-100	-100
Waterfowl	279	835	0	0	Yes	Yes	-100	-100
Small game (seasonal)	245	38	0	0	Yes	Yes	-100	-100
Bear	824	565	0	0	Yes	Yes	-100	-100
Moose	2 007	4 074	0	0	Yes	Yes	-100	-100
Licenses together	10 182	34 677	0	0				

	Expenditures of hunters and fishers in 2013, EUR			Change in expenditures per license: Regional %	Tourist %	New expenditure level, EUR: Regional	Tourist	Total
License type	Tourist	Regional	Tourist					
Fishing	784 793	4 627 928	5 412 721	0	0	784 793	4 627 928	5 412 721
Grouse	248 088	2 995 250	3 243 338	0	0	0	0	0
Waterfowl	28 089	208 460	236 549	0	0	0	0	0
Small game (seasonal)	78 432	20 630	99 062	0	0	0	0	0
Bear	963 395	803 650	1 767 045	0	0	0	0	0
Moose	1 980 616	3 574 696	5 555 312	0	0	0	0	0
Total consumption, EUR	4 083 413	12 230 615	16 314 028			784 793	4 627 928	5 412 721

Regional economic impacts	Lapland: Total impact, Per currency unit
GDP change, EUR / expenditures change, EUR	0,222
Private consumption change, EUR / expenditures change, EUR	1,097
Employment change, person-years / expenditures change, million EUR	2,862

Background information, 2013	Lapland
Regional GDP, million EUR	5 720,50
Private consumption, million EUR	3 196,80
Employment, person-years	70 813

Direct impacts of expenditures and shares	
Total change in expenditures, EUR	-10 901 307
Total change in expenditures, %	-66,8
Change in the share of private consumption, %	-0,341
Change in the share of Regional GDP, %	-0,191
Direct employment in accordance with % of GDP	-134,9
Direct employment according to industry-wise cons. shares	-136,7

Multiplier effect	
Change in regional GDP, EUR	8 482 973
Change in private consumption, EUR	-1 058 180
Change in employment, person-years	103,8

The total impact	
Change in regional GDP, EUR	-2 418 334
Change in private consumption, EUR	-11 959 487
Change in employment, person-years	-31,2

FIGURE 1. Excel-based assessment tool for the regional economic impacts of Metsähallitus hunting and fishing customers in 2013
RYSUNEK 1. Analiza regionalnych wpływów ekonomicznych klientów Metsähallitus w 2013 roku oparta na formularzu Excel

Source: Screen capture from an English translation of the excel tool.

hunting and fishing activities in the year 2013 exceeded EUR 36.7 million. Secondly, taking into account the multiplier impact, the total impact on regional GDP was estimated, calculated separately for hunting and fishing. As presented in Table 4 the total impact of hunting and fishing at the state-owned land in Finland on regional GDP was estimated for more than EUR 7,1 million. The contribution of hunting is EUR 5,1 and that of hunting is EUR 2,0 million.

It was observed that the total impact on regional GDP from hunting and fishing tourism is smaller than the change of shock variable private consumption. This is explained by increasing imports from other Finnish regions and from abroad when tourism based private consumption increases. The other explanation is that there has been some crowding-out effects from the tourism sector with regard to the other primary, industry and service sectors. Resources, like employment have been directed toward tourism while some other sectors have lost employment because there is a limited size of regional labour force. The results indicate that hunting and fishing tourism creates new working opportunities. Hunting contributes a total of 62,2 and fishing 24,0 person-years. Developing the hunting and fishing destination areas to be more self-sufficient in providing the services that hunters and fishermen demand would increase the impacts on regional economic growth and employment.

Presentation of the tool

The Excel-based tool can be used to evaluate the regional economic effects of hunting and fishing for the year 2013. It can also be used to evaluate a short-run situation where there is a change in the regional allocation of the number of licenses sold. The results can be calculated separately for fishermen and hunters, tourists and locals. The structural differences in money spending between tourists and regionals are taken into account in the calculations. The tool presents the regional economic impacts in form of changes in regional GDP, private consumption and employment.

In addition, it is possible to influence the change the use of money per license. Changes in relative prices affecting the expenditures can be raised or lowered for situations where such changes are significant. Within the calculations, the overall impact is divided into direct and multiplier impacts.

CONCLUSIONS

The hunting and fishing licenses of Metsähallitus may be regarded as an investment in nature, since the income gained from the sales is used by the state-owned company to provide several beneficial nature services. The results of this study present also the hunting and fishing licenses as an investment fund source for the regional economy.

One of the major observations in the study is that there are high regional differences in economic impacts as well as the customers' behaviour patterns. In the Northern parts of Finland, especially, the scale of hunting and fishing activities as well as the length of the trips have a visible impact on the regional economy. Developing the hunting and fishing destination areas towards increased self-sufficiency in providing the services that hunters and fishers demand would increase the positive impacts on regional economic growth and employment within the region.

As presented in the paper, hunting and fishing activities in Finland are strongly connected with travelling; within or outside the region of residence. Therefore, without the possibilities provided by Metsähallitus, it can be assumes that Finnish domestic nature tourism could be significantly reduced.

It is assumed that if the study could be arranged at a municipal level, even higher differences would be evident, especially between the rural and urban areas. Therefore, for future study, several data improvements and a focus at municipal level is recommended.

The full version of the study is described in Finnish language in Ruralia Institute Reports 132 (Zimoch et al. 2014).

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APPENDIX 1. BRIEF PRESENTATION OF CGE REGFIN MODEL

Computable General Equilibrium model CGE RegFin model includes and takes into account a large number of economic factors, among others:

- constraints on total availability of factors of production (labour, capital, land)
- sectorial production and their demand for factors of production
- dependencies of producer sectors in expenditures and sales
- effects from differences in business structure between the regions
- transportation infrastructure investments
- households', businesses' and public sector's non-linear decision-making

– investors' cautious profit-seeking behaviour
– time dimension (in dynamic version)
– capital stock accumulation via net investments guided by the changes in the rate of return to capital
– wage differences between the regions
– regional population changes and demographics
– money flows into-and out from the region through domestic and international trade.

The comparative-static CGE RegFin model is influenced by famous Australian ORANI, MONASH, MMRF and TERM models (Wittwer 2012). The family of RegFin models has been developed and used since 1998. The model is built on a neo-classical economic theory (Figure 3).

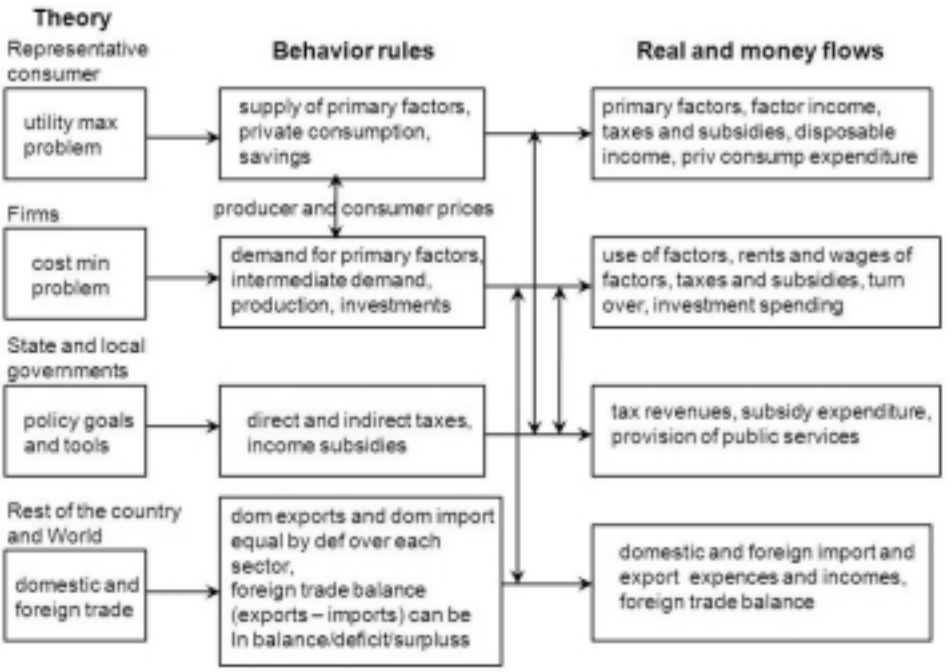

FIGURE 2. RegFin model's theory
RYSUNEK 2. Oparcie teoretyczne modelu RegFin

In RegFin, like in all CGE models, the key principle is that in the regional economy "everything affects everything". For this reason, no part of the economy can be analysed separately.

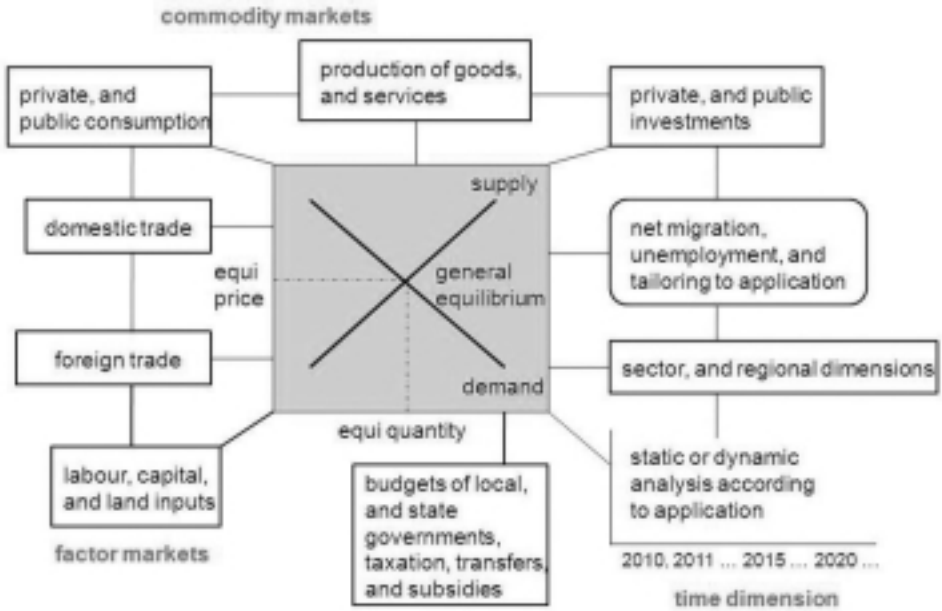

FIGURE 3. Interdependencies in the RegFin model
RYSUNEK 3. Współzależności w modelu RegFin

WPŁYW MYŚLISTWA I WĘDKARSTWA NA REGIONALNY ROZWÓJ GOSPODARCZY W FINLANDII

Streszczenie: Przedsiębiorstwo państwowe, Metsähallitus, administruje państwowe obszary lądowe i wodne w Finlandii, obejmujące łącznie około 12 milionów hektarów. Jednym z obowiązków administracyjnych przedsiębiorstwa jest zapewnienie myśliwskich i wędkarskich możliwości korzystania przez klientów z zasobów łowieckich i rybnych W 2013 roku wydanych zostało więcej niż 81 000 pozwoleń myśliwskich oraz 71 000 pozwoleń wędkarskich. Jak przedstawiono w badaniu, w ciągu jednego sezonu, klienci Metsähallitus wydali ponad 33 mln EUR w regionach objętych pozwoleniem. Artykuł ukazuje, że myśliwi i wędkarze w Finlandii chętnie podróżują, a ich wydatki wspierają regionalne gospodarki.

Latem i jesienią 2013 roku, Metsähallitus przeprowadziło badanie, które dostarczyło szczegółowych i aktualnych informacji, które mogły być wykorzystane do badań ilościowych i jakościowych. W badaniu, prywatne wydatki myśliwych i wędkarzy zostały zaklasyfikowane w poniższe grupy: handel, zakwaterowanie, restauracje, transport publiczny oraz rozrywka. Dodatkowo w badaniu przeanalizowano również wydatki bardziej szczegółowo, przedstawiając koszty uwzględniając wydatki: na podróż, na dzień wyprawy, na pozwolenie. Ponadto lokalizacja wydatków została podzielona na region przeznaczenia pozwolenia, region zamieszkania oraz „po drodze" między tymi dwoma. Na przykład, przeciętny myśliwy polujący na głuszce z krótkim pozwoleniem (1–7 dni) w 2013 roku przeznaczył około 150 euro na polowanie w regionie zamieszkania, a więcej niż 440 euro za wycieczkę, jeśli obszar polowania mieścił się poza regionem zamieszkania.

RegFin, regionalny obliczalny model równowagi ogólnej, został użyty w tym badaniu do obliczenia szerszych wpływów gospodarczych na szczeblu regionalnym, a także posłużył jako podstawa do narzędzia oceny opartej na programie Excel. Ocena regionalnych wpływów

gospodarczych koncentruje się na podstawowych wskaźnikach ekonomicznych, takich jak regionalny produktu krajowy brutto (PKB), wydatki gospodarstw domowych, oraz zatrudnienie. Wyniki badań wskazują, że aktywność myśliwska i wędkarska ma pozytywny wpływ na gospodarkę regionalną. Analizując jedynie regiony docelowe pozwoleń wydanych w 2013 roku, myślistwo i wędkarstwo na ziemiach państwowych w Finlandii „dodało" 7 mln EUR do regionalnego PKB, stworzyło 86,5 lat pracy, i wyprodukowało wydatki gospodarstw domowych na poziomie 36,7 mln euro. Stwierdzono także, że inwestycje w regionalnych usługach związanych z działalnością myśliwską/wędkarską dodatkowo zwiększa regionalne wpływy gospodarcze klientów Metsähallitus.

Słowa kluczowe: regionalne wpływy gospodarcze, model równowagi ogólnej, wędkarstwo rekreacyjne, myślistwo, turystyka