Co-funded by the Erasmus+ Programme of the European Union

Economic dimension of volunteering in sport

Methodological manual on measuring the economic impact of volunteering in sport

AUTHORS

SportsEconAustria Institute of Sport Economy: Günther Grohall

Sheffield Hallam University: Themistoklis Kokolakakis

SportsEconAustria Institute of Sport Economy: Anna Kleissner

Croatian Olympic Committee: Alma Papić

CO-AUTHORS

Sheffield Hallam University: Robbie Millar

Institute of Economic Structures Research: Gerd Ahlert

Papageorgiou University Hospital: Eleftherios Tsiridis

Papageorgiou University Hospital: Eustathios Kenanidis

Mykolas Romeris University: Vilma Čingienė

HAN University of Applied Sciences: Jelle Schoemaker

HAN University of Applied Sciences: Willem de Boer

Public University of Navarre: Fernando Lera-López

Public University of Navarre: Andrea Ollo López

Public University of Navarre: Antonio Gómez Gómez-Plana

Public University of Navarre: Fabíola Zambom Ferraresi

LINGUISTIC VERSIONS

Original: EN

ABOUT THE PUBLISHER

Manuscript completed in November 2022

This document is available on the Internet at:
https://evisproject.eu/publications/

This document was produced as an intellectual output of the project entitled 'Economic dimension of volunteering in sport' (EVIS) co-funded by the Erasmus+ Programme of the European Union.

Co-funded by the Erasmus+ Programme of the European Union

Collaborative Partnership on Economic Dimension of Volunteering in Sport

Croatia	Croatian Olympic Committee	Alma Papić
Austria	SportsEconAustria Institute for Sport Economy	Günther Grohall
Austria	SportsEconAustria Institute for Sport Economy	Anna Kleissner
UK	Sheffield Hallam University, SIRC	Themistoklis Kokolakakis
UK	Sheffield Hallam University, SIRC	Robbie Millar
Croatia	Ministry of Tourism and Sport	Marija Crnković
Croatia	Ministry of Tourism and Sport	Roberta Karadža
Germany	Institute of Economic Structures Research	Gerd Ahlert
Greece	Papageorgiou University Hospital	Eleftherios Tsiridis
Greece	Papageorgiou University Hospital	Eustathios Kenanidis
Lithuania	Mykolas Romeris University	Vilma Čingienė
Netherlands	HAN University of Applied Sciences	Jelle Schoemaker
Netherlands	HAN University of Applied Sciences	Willem de Boer
Spain	Public University of Navarre	Fernando Lera-López
Spain	Public University of Navarre	Andrea Ollo López
Spain	Public University of Navarre	Antonio Gómez Gómez-Plana
Spain	Public University of Navarre	Fabíola Zambom Ferraresi

Table of Contents

List of Tables

List of Figures

List of Abbreviations

CPA	Classification of Products by Activity, categorization of products used in the System of National Accounts
GVA	Gross Value Added
GDP	Gross Domestic Product
IOT	Input-Output Table (pl.: IOTs)
MR-IOT	Multiregional Input-Output table (pl.: MR-IOTs)
MR-IOT:S	Multiregional Input-Output table for sport (pl.: MR-IOTs:S)
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne, categorization of economic activities in the System of National Accounts
PPP	Purchasing Power Parities
SNA	System of National Accounts
SSA	Sport Satellite Account
VSA	Volunteering Satellite Account

1. Overview

There are two ways to calculate the impact of volunteering in this study. The first is to use the online tool developed and provided by the project. Its big advantages are that it is readily available, and results can be obtained with just a few clicks, even if the user has no knowledge about economics. The data used are national averages for each sector; findings are therefore well comparable to data from the rest of the economy.

However, sometimes more rigorous research is necessary which cannot be done by means of the online tool. The second, more analytical, approach has the obvious advantage of not being limited by the assumptions of the online tool, especially if an activity performed by a volunteer is not available.

2. Calculating the Economic Impact of Volunteering

Prerequisites:

- A national input-output table (IOT) for sport (also known as IOT:S, 'Sport Satellite Account', or SSA) or just a nation IOT. SSAs are better suited to perform the task as they depict the special structures of Gross values added (GVA) and intermediate goods and services of sport. However, a standard IOT is also suitable and results will often not differ a lot. National IOTs are provided by the National Statistics Offices and by Eurostat[1].
- The amount (in hours) of the volunteers' work assigned to CPA or NACE categories (depending on the categorisation of the national IOT/SSA). These categories describe products (CPA) or economic activities (NACE).
- Hourly wages typical for the assigned CPA categories.

In the following, the manual will only use 'IOT' and 'CPA' for the sake of easier reading although SSAs and NACE can be used as well without barely any changes.

The volunteers' work can be interpreted to have two economic dimensions:

a) The work itself, which is unpaid and is thus not present in the System of National Accounts (SNA). Under standard economic circumstances (i.e., without volunteering), this work would have to be paid for and can thus be given a 'shadow-price'.
b) The impact of the work on the rest of the economy by requiring intermediate goods and services. Since these intermediate goods and services are produced and sold regularly, they are part of the SNA and – given a proper model – can be identified and their value calculated.

The following steps are to explain the research done by the project team in a way that other economists can replicate it. The following sections will lay out the basic ideas. At first, the concept of the Input-Output tables (IOTs) and their analyses will be introduced. This methodology calculates the impact of an economic activity in terms of GVA and employment (and many other indicators). As volunteering is special – there is no payment and thus it does not show up in the SNA while intermediate goods and services are part of the SNA - a Volunteering Satellite Account (VSA) should be integrated into the IOT.

[1] See https://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/data/database or use the Eurostat code naio_10_cp1700 for CPA-based and naio_10_cp1750 for NACE-based IOTs. Most likely only one of them is available for any one Member State.

2.1. The Amount of the Volunteers' Work

2.2. Assigning the Work

In the survey, the volume in hours and the kind of work done by the volunteers is retrieved. To use that information in the SSA, the different kinds of work must be mapped to the SNAs sectors. Members of the board act like employees in head offices, whilst preparing food in the club's kitchen is similar to food and beverage serving services.

One needs to identify these different tasks that volunteers do and assign them to a CPA[2] category. CPA is used to categorize sectors of the economy by the produced goods and service. As an example, the first sector of an IOT typically is called 'Products of agriculture, hunting and related services' and has the number A01. The more numbers appear in the code, the more detailed the sector under consideration. A subsector of the above example is A01.4 'Live animals and animal products'. Almost all sectors use one letter and two numbers in the IOT. Some of the more frequently found activities could be (activity followed by a 2-digit CPA category – the title of which may be shortened):

- Coaching: R93 Sporting services;
- Administration: M70 Services of head offices; management consulting services;
- Repairing machines: C33 Repair and installation services of machinery and equipment;
- Installation works (electricity, plumbing, construction finishing, …): F43 Specialised construction works;
- Preparing food: I56 Food and beverage serving services;
- Cleaning laundry: N81 Services to buildings;
- Transportation: H49 Land transport services.

An exhaustive list of all current CPA categories used in IOTs is given in Table 1.

Table 1 List of CPA categories

A01	Products of agriculture, hunting and related services
A02	Products of forestry, logging and related services

[2] 'Classification of Products by Activity' (https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=CPA_2_1&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC), the categorization typically used by IOTs. In case the IOT uses NACE ('Nomenclature statistique des activités économiques dans la Communauté européenne', https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NACE_REV2&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC&IntCurrentPage=1), one has to use this format. Concerning the typical tasks of volunteers, CPA and NACE will be very similar.

A03	Fish and other fishing products; aquaculture products; support services to fishing
B	Mining and quarrying
C10-12	Food, beverages and tobacco products
C13-15	Textiles, wearing apparel, leather and related products
C16	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
C17	Paper and paper products
C18	Printing and recording services
C19	Coke and refined petroleum products
C20	Chemicals and chemical products
C21	Basic pharmaceutical products and pharmaceutical preparations
C22	Rubber and plastic products
C23	Other non-metallic mineral products
C24	Basic metals
C25	Fabricated metal products, except machinery and equipment
C26	Computer, electronic and optical products
C27	Electrical equipment
C28	Machinery and equipment n.e.c.
C29	Motor vehicles, trailers and semi-trailers
C30	Other transport equipment
C31_32	Furniture and other manufactured goods
C33	Repair and installation services of machinery and equipment
D	Electricity, gas, steam and air conditioning
E36	Natural water; water treatment and supply services
E37-39	Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services & other waste management services
F	Constructions and construction works
G45	Wholesale and retail trade and repair services of motor vehicles and motorcycles
G46	Wholesale trade services, except of motor vehicles and motorcycles
G47	Retail trade services, except of motor vehicles and motorcycles
H49	Land transport services and transport services via pipelines
H50	Water transport services
H51	Air transport services

H52	Warehousing and support services for transportation
H53	Postal and courier services
I	Accommodation and food services
J58	Publishing services
J59_60	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services
J61	Telecommunications services
J62_63	Computer programming, consultancy and related services; Information services
K64	Financial services, except insurance and pension funding
K65	Insurance, reinsurance and pension funding services, except compulsory social security
K66	Services auxiliary to financial services and insurance services
L68B	Real estate services excluding imputed rents
L68A	Imputed rents of owner-occupied dwellings
M69_70	Legal and accounting services; services of head offices; management consultancy services
M71	Architectural and engineering services; technical testing and analysis services
M72	Scientific research and development services
M73	Advertising and market research services
M74_75	Other professional, scientific and technical services and veterinary services
N77	Rental and leasing services
N78	Employment services
N79	Travel agency, tour operator and other reservation services and related services
N80-82	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services
O	Public administration and defence services; compulsory social security services
P	Education services
Q86	Human health services
Q87_88	Residential care services; social work services without accommodation
R90-92	Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services
R93	Sporting services and amusement and recreation services
S94	Services furnished by membership organisations
S95	Repair services of computers and personal and household goods

S96	Other personal services
T	Services of households as employers; undifferentiated goods and services produced by households for own use
U	Services provided by extraterritorial organisations and bodies

Source: SpEA, 2022.

In the case of the EVIS project, data from Eurostat was used to calculate the effects. This had the advantages of being readily available and standardised for all partner states. However, many data are restricted to 2-digits. If the calculations are to be replicated for another economy, it is advisable to use more detailed data, especially for mapping the activities. The main reason is that the sectors described above are very broad and cover a wide range of activities. Any data, including labour costs, will be averaged over these activities and thus often less representative. As an example, sector '69_70' contains legal and accounting services as well services of head offices. Therefore, it holds activities of lawyers, accountants, HQ-managers and many more. If one has data on the single activities, their costs are reflected better in the calculations. Also, having just a few, broad sectors may lead to different activities being mapped to the same sector. Although this is not wrong, identical labour costs would be assigned to these different activities.

2.3. Arranging the VSA

Assuming the VSA is prepared in MS Excel or another spread-sheet programme, one needs to extend the original IOT's intermediate goods matrix by one row and one column for each activity.

Figure 1: A simplified IOT including with the sector containing the sport clubs highlighted

		Tot. interm. goods output				Total final uses				
		Good 1	Good 2	**Sport Clubs**		Private cons.	Public cons.	Investments		Total Use
	Good 1									
	Good 2									
	Sport Clubs									
Total interm. Consumption										
	Cons.fixed cap.									
	Other net taxes									
	Employ. Comp.									
	Net surplus									
Gross value added										
Output										

Source: SpEA, 2022.

Figure 1 shows a simplified[3], standard IOT with the sector containing the sport clubs highlighted. Please note that it is a domestic IOT, because using total or imported values would lead to wrong results. To see that, assume that a specific good is produced domestically as well as imported, but that the imported goods are used differently compared to the domestic ones. Just for the sake of argument, one may use coal for energy production (imported) and for chemistry (domestically produced). Both show up in the same category 'coal'. Therefore, using the total IOT for the analysis of an increase of energy production would result in an increasing demand for generic 'coal'. Thus, an increase in the domestic coal production would be reported – which is wrong. Using the domestic IOT as the basis for the calculation yields the correct results, as the domestic IOT shows no intermediate demand for domestic coal by the energy sector. Therefore, one should always use the domestic IOT for such analyses.

Since 'Services of sport clubs' are represented by the 4-digit R93.12 code, the associated 2-digit sector will be R93 or R93.1 in case an SSA is used instead of a plain IOT. Assume that two different CPA-activities are identified for the volunteers. Therefore, two rows and two columns are added to the intermediate goods matrix which form the first part of the VSA. They are displayed next to the sport clubs in Figure 2.

[3] Especially foreign trade, consumption of non-profit organisations serving households, and taxes less subsidies on products were left out.

Figure 2: A simplified IOT including with two additional rows and columns in the intermediate goods matrix

	Total intermediate goods output						Total final uses				
	Good 1	Good 2	**Sport Clubs**	**VSA Board**	**VSA Food**		Private cons.	Public cons.	Investments		Total Use
Good 1											
Good 2											
Sport Clubs											
VSA Board											
VSA Food											
Total interm./final cons.											
Cons.fixed cap.											
Other net taxes											
Employ. comp.											
Net surplus											
Gross value added											
Output											

Source: SpEA, 2022.

2.4. Hourly Wages

Let us assume that survey results indicate that 100 hours are volunteered by member of a board and 100 hours for preparing food. Next, one needs to find hourly wages for these activities. To stay consistent with the SNA, it is suggested to calculate those from the data provided in the IOT via the wages and salaries given for each sector. If that is not plausible, different hourly wages can be applied within reasonable limits.

There is an ongoing debate about the correct wage for calculating the shadow price. Possible alternatives to the suggested sectorial averages are economy-wide averages and the minimum wages. Using the economy-wide averages is appealing due to the volunteers working in possibly all sectors and performing different activities as volunteers. This mix may be best reflected in the economy-wide averages. The use of minimum wages can be argued for by pointing out that since volunteers often perform activities different than the ones they are trained for in their jobs, they are less productive, and the minimum wage would thus be a suitable price – although this would be a perfect proof that volunteering can be used to increase personal skills. On the other hand, volunteers may opt-in themselves for tasks they know well. The minimum wage can also differ between sectors and because of that it may introduce further complications in the research and the model.

The shadow price can be interpreted as the replacement cost for a volunteer's activity. As an example, instead of letting a volunteer to paint benches in, say, four hours, a professional is hired. The professional would do the same job in just three hours and thus be more productive. Thus, using the professional's hourly wage for calculating the shadow price would overestimate the shadow price. However, if a professional is hired, the club does not only have to pay for the work time, but also for the according overheads, removing the problem of overestimation.

For these reasons, it is suggested to use sectorial averages for the wages.

2.5. Shadow Price of Volunteering

If one finds that the average hourly wage for working in the head office of a company equals 55 euros, a total of 100 x 55 = 5,500 euros is calculated as the shadow price for this voluntary work (assuming 100 hours of volunteering). As an example, for preparing food, assume the average wage in the sector of food and beverage serving services equals 12 euros. The shadow price for this work thus equals 100 x 12 = 1,200 euros.

This value is entered into the cell holding the employees' compensations in the respective column of that country's VSA called 'Employ.' comp.' in Figure 3, indicated by arrow 1. The green numbers indicate positive changes to the original values, which is mainly important for the economy-wide sums in the cells with white background.

Figure 3: A simplified IOT including the first part of the VSA

		Total intermediate goods output						Total final uses					Arrow
		Good 1	Good 2	**Sport Clubs**	**VSA Board**	**VSA Food**		Private cons.	Public cons.	Investments		Total Use	
	Good 1												
	Good 2												
	Sport Clubs												
	VSA Board							5.500			5.500	5.500	
	VSA Food							1.200			1.200	1.200	
Total interm./final cons.								7.700			7.700	7.700	
	Cons.fixed cap.												
	Other net taxes												
	Employ. comp.				5.500	1.200	7.700						1
	Net surplus												
Gross value added					5.500	1.200	7.700						2
Output					5.500	1.200	7.700						3

Source: SpEA, 2022.

2.6. Arranging the VSA around the Shadow Price

Since these wages and salaries are in reality unpaid and depict the shadow-price of volunteering, nothing has to be subtracted from any other sector. These number are simply added to the SNA. As there are no other components of GVA, total GVA equals wages and salaries which can be seen two rows below the arrow (arrow 2). Since there are also no intermediate goods and services purchased in this part of the model, output equals GVA as shown in the last row (arrow 3).

Due to the equality of output and total use (as in standard accounting), the rightmost column has to hold the same values as the last row in Figure 3. Therefore, the output – and thus in this case wages and salaries of the volunteers – are entered there as well as shown by arrow 4. As total use is just a sum over all different forms of consumption, the recipient of the volunteers' services has to be identified, in this case the sport clubs. However, that leads to two problems:

- If the sport clubs are to receive the aforementioned 5,500 euros and 1,200 euros output, the clubs' output increases as well – which directly increases the clubs' total use. Thus, this addition of the shadow price would spread an impact through the whole economy. However, the shadow price is just academic research, it is not paid and thus it is not part of the real economy in terms of the SNA. Therefore, its impact must not leave the VSA.

- Adding the 5,500 and 1,200 euros to the intermediate goods column of the sport clubs obviously alters their intermediate goods structure – and thus again it has an impact on the whole economy directly via the technical coefficients. Due to the same arguments as above, this should not happen.

Therefore, the 5,500 and 1,200 euros in total use have either to be dropped completely – leaving the resulting IOT unbalanced and thus wrong –, or be accounted for as final use. The latter is the preferred approach as the IOT stays coherent and can be analysed in the standard way. Further, the final users actually do benefit from the volunteers' activities. In the example in Figure 3, the whole amount was accounted for in private consumption (arrow 5). If it seems more appropriate, these deliveries can also be booked into public consumption or any other category of final use.

2.7. Volunteers' Intermediate Goods and Services

After completing the VSA for the shadow price of volunteering, one can switch to dimension b, the use of intermediate goods and services by the volunteers. Let us assume that the volunteers require 1,000 euros of equipment ('Good 1') and 800 euros for travel ('Good 2') which is given to them by the club. Putting aside the thoughts on dimension a for the sake of simplicity, the VSA in Figure 4 is obtained.

Figure 4: A simplified IOT including the intermediate goods and services

	Total interm. goods output					Total final uses				
	Good 1 (equip.)	Good 2 (travel)	Sport Clubs	VSA b		Private cons.	Public cons.	Investments		Total Use
Good 1 (equip.)			-1,000	1.000						
Good 2 (travel)			-800	800						
Sport Clubs										
VSA b										
Total interm./final cons.										
Cons.fixed cap.										
Other net taxes										
Employ. comp.										
Net surplus										
Gross value added										
Output										

Source: SpEA, 2022.

The values enter the model at the places indicated by the two horizontal arrows. Since these intermediate goods and services are purchased by the club, in reality, they are already accounted for in the SNA and are thus part of the IOT in the sport club's column. Therefore, they have to be removed , otherwise they would be double-counted. This is depicted as '-1,000' and '-800' in the club's column just next to the column of the VSA indicated by the diagonal arrow.

2.8. Arranging the VSA around the Intermediate Goods and Services

Since there is no other intermediate consumption and no GVA (that is included in dimension a), the output of VSA b equals the sum of the intermediate inputs or 1,800 euros in the example pointed at by arrow 1 in Figure 5. Due to the equality of output and total use, these 1,800 have to be entered at the rightmost column (arrow 2). As the volunteer pays for the goods in the first hand (e.g., a bill for gasoline is paid by them and only afterwards refunded by the club), the values in total use are booked as private consumption. As can be seen, the negative entries in the sport club's row and column cancel each other out with the corresponding values of the volunteers. Therefore, all changes reflect the relation between those two entities while the rest of the economy remains unaltered.

As these purchases and deliveries are real and accounted for in the basic IOT, one can – and must – book them into the intermediate goods matrix as shown. In contrast to the shadow price of volunteering, the changes in the intermediate goods matrix reflect real transactions which become visible once we use the VSA as a magnifying glass to zoom into the IOT.

Figure 5: A simplified IOT including the second part of the VSA

		Total interm. goods output					Total final uses				
		Good 1 (equip.)	Good 2 (travel)	Sport Clubs	VSA b		Private cons.	Public cons.	Investments		Total Use
	Good 1 (equip.)			-1,000	1.000	0					
	Good 2 (travel)			-800	800	0					
	Sport Clubs	0	0	0	0	0	-1,800	0	0	-1,800	-1,800
	VSA b	0	0	0	0	0	1.800	0	0	1.800	1.800
Total interm./final cons.		0	0	-1,800	1.800	0	0	0	0	0	0
	Cons.fixed cap.			0	0	0					
	Other net taxes			0	0	0					
	Employ. comp.			0	0	0					
	Net surplus			0	0	0					
Gross value added				0	0	0					
Output				-1,800	1.800	0					

Source: SpEA, 2022.

2.9. General Description of the Whole Model

The two dimensions – shadow price of volunteering and use of intermediate goods by the volunteers – are combined in one model as depicted in Figure 6. The different wages of dimension a are called '+a_i', where i takes values 1 and 2, in the example, as there are only two different activities. Their sum is abbreviated as Σa_i. Intermediate goods and services given to the volunteers in dimension b are labelled '+b_i' and their sum is abbreviated as Σb_i.

Figure 6: A simplified IOT including the two parts of the VSA

	Good 1	Good 2	Sport Clubs	VSA a_1	VSA a_2	VSA b	Total intermediate goods output	Private cons.	Public cons.	Investments	Total final uses	Total Use
Good 1			$-b_1$			$+b_1$						
Good 2			$-b_2$			$+b_2$						
Sport Clubs								$-\Sigma bi$			$-\Sigma bi$	$-\Sigma bi$
VSA a_1								$+a_1$			$+a_1$	$+a_1$
VSA a_2								$+a_2$			$+a_2$	$+a_2$
VSA b								Σb_i			Σb_i	Σb_i
Total interm./final cons.			$-\Sigma bi$			Σb_i		Σa_i			Σa_i	Σa_i
Cons.fixed cap.												
Other net taxes												
Employ. comp.				$+a_1$	$+a_2$		Σa_i					
Net surplus												
Gross value added				$+a_1$	$+a_2$		Σa_i					
Output			$-\Sigma bi$	$+a_1$	$+a_2$	Σb_i	Σa_i					

Source: SpEA, 2022.

If everything is done right, the new IOT including the complete VSA is ready to use. Please check that the cells containing sums (the three vectors starting with 'Total' in the above figures as well as GVA, output, and total use) contain the right values. This is especially important for the row- and column-wise sums of the intermediate goods matrix. The sums outside of the VSA (Good 1, Good 2, Sport Clubs in the figures above) must not change, the sums of VSA-a must be 0 and the sum of VSA-b must equal Σb_i.

Note that

- in standard IOTs, wages '$+a_i$' must be removed from their original sectors (here these would be the clubs). However, as this research is to calculate the so far unpaid value of voluntary work, that work's value is not in the SNA. Thus, it must not be removed from the original sector as it is not included there! Therefore, there are only '$+a_i$' in Figure 6's wages and salaries, but no balancing '$-a_i$'. Strictly speaking, this part of the VSA thus extends the SNA as wages and salaries are added to the country's total. Running standard input-output analyses yields the results of dimension a;
- since the columns of VSA-a contain non-zero values in wages and salaries ('$+a_i$'), but no other inputs, GVA and output take on these values ('$+a_i$');

- since VSA-a generates output, it also has these values ('$+a_i$') in total use and therefore also in its final use part;
- VSA-b does not generate direct GVA;
- VSA-b receives intermediate goods and services worth the sum of all entries '$+b_i$' which equals Σb_i, so it generates output of the same amount;
- since VSA b generates output worth Σb_i, and the according negative change can be found in the sport clubs, they have to have the same values in its total use;
- output (total use) of VSA-b (Σb_i) is booked as private consumption since the volunteers account for it in the first place (e.g. gasoline for transportation is paid by the volunteer and only later refunded by the club);
- red values are subtracted from the cells' original values, green values are added;
- all entries of VSA-b cancel out with the according entries in the sport clubs leading to no changes in the rest of the economy;
- all entries of VSA-a are additions to the SNA and are therefore reflected in the respective economy-wide sums. These changes are the shadow prices.

In the general form, dimension a of the VSA has n sectors (in Figure 6, n equals 2) where n is the number of sectors to which the volunteers' work can be assigned. This is shown as the rows and columns 'VSA a_1' and 'VSA a_2' in Figure 6. The second dimension b, indicated by row and column 'VSA b' in Figure 6 includes all goods and services given to the volunteers. They are entered in a single vector holding the intermediate goods and services, while the GVA-vector has zeros only.

The result is a model which allows to quantify the impact of volunteering along the two dimensions a) and b) for every economy described by an IOT.

2.10. Analysing the Model for the Shadow Price of Volunteering

The shadow price of volunteering can be directly read-off the VSA. Values of '$+a_i$' give the shadow price for each activity. If the clubs would like or have to replace the volunteers in the activity by professionals, they would have to pay that amount. This can also be interpreted as the free contribution the volunteers give to the benefit of the economy and thus also of the society.

2.11. Analysing the Model for the Impact of the Intermediate Goods

A proper explanation of input-output analysis cannot be done in a report like this, but a short introduction of the topic will be given. A long and thorough textbook is Miller and Blair (2009). The following text is based on a standard IOT. Since a satellite account as the VSA is made in such a way that it can be treated as a normal sector, all methods explained hold for satellite accounts as well.

2.11.1. Basic IOT Layout

A good starting point is the above used simplified IOT, but this time using numbers as in Figure 7. The most important areas are coloured:

- Intermediate goods matrix: top left, orange;
- Final use: centre top, blue;
- Total use: top right, green;
- Output: lower left, green;
- Gross value added: centre left, purple.

Please note that the vectors containing the sums are also coloured, but use boldface letters.

Figure 7: A simplified IOT with exemplary numbers

		Total interm. goods output				**Total final uses**				
		Good 1	Good 2	Good 3		Private cons.	Public cons.	Investments		Total Use
	Good 1	1	2	1	**4**	5	0	6	**11**	**15**
	Good 2	3	17	10	**30**	10	0	10	**20**	**50**
	Good 3	0	10	10	**20**	5	5	5	**15**	**35**
Total interm./final cons.		**4**	**29**	**21**	**54**	**20**	**5**	**21**	**46**	**100**
	Cons.fixed cap.	1	2	3	**6**					
	Other taxes	3	4	3	**10**					
	Employ. comp.	5	13	5	**23**					
	Net surplus	2	2	3	**7**					
Gross value added		**11**	**21**	**14**	**46**					
Output		**15**	**50**	**35**	**100**					

Source: SpEA, 2022.

The intermediate goods matrix reports how much of each good is necessary for the production of each good. Sources are given in the rows, destinations in the columns. Therefore, for the production of good 1 (first column) 1 unit of good 1 is required, 3 units of good 2 and nothing of good 3. Imports, if given, are reported just below the intermediate goods and are treated very much like them.

Gross value added is the refinement of intermediate goods. As an example, 21 units of intermediate goods are necessary for the production of good 3 (sum of the third column of intermediate goods). If one adds 3 units of fixed capital (depreciation of fixed capital), 3 units of taxes (public hand), 5 units of wages (human capital) and 3 units of surplus (entrepreneurship), and thus 14 units of GVA, a total of 21 + 14 = 35 units of output are generated. GVA is thus the sum of 'payments' to the four primary production factors fixed capital, the public hand, human capital and entrepreneurship. Every company or institution takes intermediate goods and applies GVA to it, resulting in a new product. As an example, a carpenter purchases boards, nails, glue and paint from other companies (intermediate goods) and applies GVA to it, turning everything into a table. This table is more useful than the separate intermediate goods and services and can thus be sold for a higher price. The difference is GVA. It is important to notice that for the production of the intermediate goods, GVA is required. The same is true for the suppliers of the suppliers and so on. In fact, everything which is produced consists of 100 per cent GVA. Some GVA may be imported – in fact practically all goods contain a certain share of foreign GVA – and the percentage of domestic GVA in a product is an important economic indicator.

Output is the sum of intermediate goods plus GVA.

Final use leaves the economic B2B cycle of intermediate goods. Five units of good 1 are purchased by private consumers, and ten units of good 2 are used as investment goods. Exports are very similar as they too leave the economy (in a fully-fledged IOT they are given right of investments).

Total use is the sum of final use and intermediate use. It is of importance to understand that the total use vector and the output vector have identical numbers, but are transposed. The 15 units of good 1 which are used either to produce other goods (intermediate use) or by the final users need to be produced somewhere. Therefore, total use must equal output for every sector.

2.11.2. Direct Effects

What is the GVA generated by the production of good 1? This can be read off the IOT directly: 11 units of GVA are generated when 15 units of good 1 are produced. That means that for every unit of good 1, 0.73 units of GVA are generated.

These effects are called 'direct effects' as they are generated directly in the analysed sector. They are 0.73 units for good 1, 21 / 50 = 0.42 units for good 2 and 14 / 35 = 0.40 units for good 3.

2.11.3. The Leontief Inverse

One may ask, how much GVA is produced by the suppliers, that is by those companies which produce the 1 + 3 + 0 units of intermediate goods necessary for good 1. A simple answer would be to multiply these numbers with the respective GVA-shares (0.73, 0.42, 0.40 as calculated above). Thus, one can say that the suppliers generate 1 x 0.73 + 3 x 0.42 + 0 x 0.40 = 1.99 units of GVA. However, this is just the effect of the 'first-round suppliers'. As was explained before, the suppliers have suppliers again and again and again. In principle, there is an infinitely long network of suppliers behind every company. As an example, note that no units of good 3 are required for good 1. But good 1 does need 3 units of good 2 and good 2 needs 10 units of good 3. Therefore, good 1 indirectly requires good 3.

A solution to this problem was developed by Wassily Leontief in his input-output analysis. He observed that for the production of the final use goods y = (11, 20, 15)' the output of x = (15, 50, 35)' is necessary. Leontief wanted to answer the following question: 'If one additional unit of final use good 1 (or good 2 or good 3) is to be produced, how much of each good has to be produced to satisfy the additional demand?'

In order to find an answer, one needs to divide intermediate demand and GVA column-wise by each sectors' output which results in Figure 8. We can see that for the production of 1 unit of good 1 we need 0.07 units of good 1, 0.20 units of good 2, nothing of good 3 and 0.73 units of GVA. These numbers can certainly be interpreted as percentages. GVA shares were already calculated above as direct GVA effects and are called v_j here, where j is the producing sector. The shares of the intermediate goods are also called 'technical coefficients' since they are determined by the technology used to produce each good (producing metal sheets needs other intermediate goods than producing financial services) and denoted as a_{ij} where i is the delivering sector and j the purchasing sector.

Figure 8: Technical coefficients and direct GVA-shares; exemplary numbers and variables

	Good 1	Good 2	Good 3
Good 1	0.07	0.04	0.03
Good 2	0.20	0.34	0.29
Good 3	0.00	0.20	0.29
Gross value added	**0.73**	**0.42**	**0.40**
Output	**1.00**	**1.00**	**1.00**

	Good 1	Good 2	Good 3
Good 1	a_{11}	a_{12}	a_{13}
Good 2	a_{21}	a_{22}	a_{23}
Good 3	a_{31}	a_{32}	a_{33}
Gross value added	v_1	v_2	v_3

Source: SpEA, 2022.

The first line in Figure 7 can be written as

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + y_1 = x_1$$

where the technical coefficients a_{ij} times the respective output (which equals total use) x_i plus final use y_i equals total use x_i. This can be done for all three lines and leads to

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + y_1 = x_1$$
$$a_{21}x_1 + a_{22}x_2 + a_{23}x_3 + y_2 = x_2$$
$$a_{31}x_1 + a_{32}x_2 + a_{33}x_3 + y_3 = x_3$$

which is a system of linear equations that can be re-written as a single matrix equation:

$$Ax + y = x$$

Apart from being much easier to write, the matrix equation can be solved quickly using matrix algebra. First, subtract Ax on both sides, then factor out x and obtain:

$$(I - A)x = y$$

where I is the identity-matrix containing ones in the main diagonal and zero everywhere else. If $(I-A)$ can be inverted, one can solve for x by

$$x = (I - A)^{-1}y$$

The part $(I-A)^{-1}$ is called the Leontief-inverse L and plays a major role in input-output analysis. It is depicted in Figure 9.

Figure 9: The Leontief inverse

	Good 1	Good 2	Good 3
Good 1	1.09	0.09	0.08
Good 2	0.38	1.76	0.72
Good 3	0.11	0.49	1.60
Sum	**1.57**	**2.34**	**2.40**

Source: SpEA, 2022.

If this inverse is multiplied by final demand y, one obtains the output. This is not only true for the original values in the IOT, but for any demand applied on the economy. If we would like to produce 1 (additional) unit of good 1, the demand vector y = (1, 0, 0)' which is used as the multiplier for L. Note that y is a column-vector for which reason the ' ' ' is added at the end to transpose the row. Carrying out the matrix-multiplication leads to x = (1.09, 0.38, 0.11)' telling us that we need 1.09 units of good 1 (including the 1 unit we would like to finally produce), 0.38 units of good 2 and 0.11 units of good 3. One can quickly see from the result and by manually going through the calculation that these are the numbers in the first column of L. The cell l_{ij} of the Leontief inverse can be interpreted as the total amount of good i which is necessary to produce 1 unit of good j.

2.11.4. Indirect Effects

The columns of the technology matrix (thus the intermediate goods matrix) tell us how much we need of each good to be directly supplied to the sector in question. The columns of the Leontief invers L tell us how much we need of each good to be in total for the sector under examination. To see the difference, nothing of good 3 is required as direct input for good 1 (intermediate goods / technology matrix). But since good 2 needs some of good 3, we need 0.11 units of good 3 in total for one unit of good 1.

Take as an example a carpenter who does not purchase any services from a water transportation company. However, the iron for the nails and the coal necessary to turn the iron into steel are transported by ship. Therefore, the carpenter also impacts the water transportation sector.

All effects taking place outside of the directly analysed sector are called indirect effects. In standard input-output analyses, they are 'upstream effects', thus they are located before the examined sector.[4] Note that in the main diagonal of L, the numbers are larger than one while in all other cells they are (usually) smaller. The unit (1.00) parts in the main diagonal represent the direct effect, and the digits trailing it (thus the '0.09' in the upper-left cell) as well as all numbers aside from the main diagonal indicate indirect effects. Taking the column-wise sum of good 1, we find a value of 1.57. Therefore, we have a direct effect of 1 unit of output and an additional indirect effect of 0.57 units of output in the whole economy.

These sums are called 'multipliers' and can be interpreted in various ways. They are at least 1.0 and show how well a sector is connected to the rest of the economy. The higher the multiplier of a sector, the more the rest of the economy benefits from activity in the sector. However, if a company or sector is vertically integrated (as an example, the carpenter buys a sawmill and produces boards by himself), some of the GVA moves from the indirect to the direct effect although only the ownership of the different steps in the GVA network has changed.

GVA is of more importance than output. Calculating the indirect GVA impact follows straight from the above concepts. We have discussed the idea of multiplying a column in the intermediate goods matrix to find the 'first-round' GVA impact of a sector. The same idea can be applied to the Leontief inverse L for the total GVA impact. We know from Figure 9 that the total output per sector necessary to

[4] There are methods to analyse downstream effects as well, but they are not required here.

produce one unit of good 1 equals L_1 = (1.09, 0.38, 0.11)'. We know from Figure 8 that in each of these sectors a GVA share of v_j = (0.73, 0.42, 0.40) can be found. Now we can multiply these vectors element-wise to find the GVA impact in each sector: good 1: 1.09 x 0.73 = 0.80; good 2: 0.38 x 0.42 = 0.16; good 3: 0.11 x 0.40 = 0.04. Therefore, by producing 1 unit of good 1, we generate (0.80, 0.16, 0.04) units of GVA in the respective sectors in total. The sum equals 0.80 + 0.16 + 0.04 = 1.00 which means that we also generate 1.00 units of GVA. This is necessary as we have not foreign trade and all goods are produced domestically. In case some goods are imported, the respective GVA is generated abroad and the share of domestic GVA is lower than 100 per cent.

It is worth noting that the element-wise multiplication performed above is in principle the same as the scalar product of the two vectors, v_1 x L_1. Since that scalar product also adds up the element-wise products, we would lose the information on GVA generated by each sector (0.80, 0.16, 0.04) and only receive the sum of 1.00 as result. In order to analyse the total GVA impact of all sectors at once, one may left-multiply the GVA shares with the whole Leontief inverse instead of a single column-vector: v_1 x L. Again, this would 'only' produce the total GVA and not the distribution to the sectors which may be of interest.

Subtracting direct effects from total effects yields the indirect effects of the supply network. Dividing total effects by direct effects results in the multipliers.

The same calculations can be done for employment, wages and salaries, or more on the ecological side CO_2- and energy content and many more. Using these calculations, one can quantify the contribution of goods and services used by the volunteers to perform their activities. Direct effects on the sector (as an example, manufacturing of sport equipment) as well as on each other sector of the economy are possible.

3. The Spread-Sheet Tool

To allow clubs and similar organisations to calculate the shadow price of their volunteers (dimension a from before), a spread-sheet tool was prepared for the partner-countries. MS-Excel® was used, but other compatible spread-sheet programs should be able to operate it as well. One can enter the time volunteers spent on different activities plus possible compensations for their work and the tool calculates the costs for the clubs if they would have to pay for that work. Hourly costs differ between countries as well as activities and include wages and salaries together with social contributions paid by employers. Thus, they can be interpreted as the equivalent costs of someone being employed by the club.[5] Data on hourly labour costs are from Eurostat for 2019, as all data for this study.

Figure 10: An overview of the tool showing exemplary data for Austria

Inputs		Results in Euros	
Activity of volunteers	Hours worked per year total	Hourly costs	Total personnel costs
Coaching:	50.0	14.60	729.79
Governance, other administration:	40.0	25.03	1,001.20
Cleaning (rooms, laundry, ...):	30.0	16.00	480.02
Preparing food:	27.5	16.49	453.57
Transportation:	10.0	22.84	228.42
IT services:	10.0	33.96	339.63
Repairing machines:	40.0	34.49	1,379.56
Installation works (plumbing, electricity, ...), painting:	5.0	25.74	128.71
Supporting events:	50.0	22.87	1,143.40
Advertising (handing out leaflets, ...):	70.0	7.64	534.84
Other activities:	30.0	27.92	837.54
Total:	**160.0**		3,276.96

Compensation of voluntary work		Shadow price of volunteering
Lump-sum payments in Euros:	150.00	
Compensation of voluntary work within the tax system:	270.00	
Payments covering expenses of the volunteers:	84.00	
Goods, vouchers and the like in Euros:	350.00	
Other compenstations in Euros:	24.00	
Total:	878.00	**2,398.96**

Source: SpEA, 2022.

The tool (see Figure 10) is split in two halves, each half having two sub-panels. On the left, data on the volunteers' activities can be entered in the upper part and possible compensations in the lower part.

[5] Note that this value may be substantially below the amount the clubs would have to pay if they hire an external company which could ask for a margin on labour and material. It is thus more likely that regular activities are done by employees while less frequent tasks are done by external companies.

The right half's upper panel gives the respective hourly costs for each activity on the left and total costs on the right. The different activities are given in the upper left. It was tried to keep the tool simple while at the same time to include as many activities as possible which volunteers would typically perform.

- 'Coaching' is the activity of giving advice and supervising persons in sport.
- 'Governance, other administration' includes the members of the executive board, members of the monitoring board as well as other administrative work like accounting and the like.
- 'Cleaning (rooms, laundry, …)' contains all kinds of comparatively low-skilled cleaning activities. Cleaning of electronic devices and other rather high-skilled activities are not included here.
- 'Preparing food' includes the act of preparation as well as serving food and drink.
- 'Transportation' is about taking active and passive participants to distant locations, typically (but not exclusively) for training or competitions. Often, one would use one's private car for this purpose.
- 'IT services' are tasks like web-site maintenance, programming and other activities which necessarily need a computer (in contrast to accounting, which is typically also done on computers, but does not necessarily need one).
- 'Repairing machines' includes repairing different kinds of machines and devices, but not electricity or plumbing which can be entered in the next category.
- 'Installation works (plumbing, electricity, …), painting' contains activities which are typically carried out in newly constructed houses after the walls and roofs are finalised. Wiring, placing the floor, plumbing, tiling, and painting are examples.
- 'Supporting events' means general activities which are done while hosting an event like showing participants the way, handing out starting numbers or providing athletes with drinks in long-distance competitions.
- 'Advertising (handing out leaflets)' is the general activity of making clubs or events better known. Only comparatively low-skilled activities are included here, not the work of advertising companies which would as an example produce commercials.
- 'Other activities' uses the economy-wide average hourly labour costs and can be used if none of the other categories fit.

The lowest row contains the sum of hours worked by volunteers. Note that fractions of hours are given as decimals, so 45 minutes equal 0.75 hours.

The lower left panel states the compensations given to volunteers. All three categories are given in euros and are summed in the last row. These compensations have to be subtracted from the value of the volunteers' work as only the remaining uncompensated part of the work can be considered truly voluntary.

In the right half, total costs are calculated as hours worked multiplied by hourly costs. The sum of all total personnel costs is given in the lower right of the upper half and can be interpreted as the value of the volunteers' work. After the compensation of voluntary work (left half's lower panel) is subtracted, the remaining shadow price of uncompensated volunteering is given in the lower right corner of the tool.

4. Monetisation of subjective wellbeing and social capital.

Among the societal impacts of sport volunteering, subjective wellbeing and social capital are the most important. They relate to outcomes such as mental wellbeing, individual development and social development. These three aspects of wellbeing can be monetised using associations with the demographic profile and average income of volunteers, creating an income compensation approach. An example of such monetisation in the case of sports participation can be found in Daniel Fujiwara's LSE discussion paper[6]. In effect, this method answers the question of how much the volunteers would be willing to pay in order to get the wellbeing benefits of volunteering.

The methodology of income compensation has to find solutions to two methodological problems:

i) As the Literature Review shows, the sport volunteers are likely to come from the 'pool' of sport participants. Since sport participation may also have equivalent effects in terms of wellbeing and social capital, we have a problem to distinguish between wellbeing attributed to participation and wellbeing attributed to volunteering.

ii) The causality direction is very ambiguous. Although the model may indicate that sport volunteering generates subjective wellbeing or new social capital, it is also true that happier people, or people with high social capital will also be more likely to be active in their communities and volunteer in sport.

To negotiate these problems, the model of income compensation has to control for sport participation and introduce instrumental variables.

4.1. Measuring Subjective wellbeing

The subjective wellbeing is captured through the self-evaluation of interviewees. It captures psychological dimensions such as life satisfaction, experienced wellbeing and life meaningfulness

The interviewees are asked to rate the following statements between 0 (at no time) and 5 (all the time).

1. I have felt cheerful and in good spirits.
2. I have felt calm and relaxed.
3. I have felt active and vigorous.
4. I woke up feeling fresh and rested.
5. My daily life has been filled with things that interest me.

[6] http://cep.lse.ac.uk/pubs/download/dp1233.pdf

It is a common practice to manipulate the scores in order to get a maximum score of 100, which becomes the theoretical maximum index of subjective wellbeing.

4.2. Measuring Social Capital

The generating social capital can fall under the categories of community engagement, personalised trust, generalised trust, community identification, and reciprocity. These questions and the categories they relate to are listed below:

Community engagement

- have you taken part in a local community project in the last 12 months (Yes/No)?
- have you volunteered for local community organisations or causes in the last 12 months (Yes/No)?
- have you been an active member of [a] local community organisation[s] in the last 12 months (Yes/No)?

Personalised trust

- I feel safe walking in my local community after dark (Would you say you strongly agree, agree, neither agree or disagree, disagree or strongly disagree).

Generalised trust

- I think that most people can be trusted (Would you say you strongly agree, agree, neither agree or disagree, disagree or strongly disagree).

Community identification

- I identify with my local community (Would you say you strongly agree, agree, neither agree or disagree, disagree or strongly disagree).

Reciprocity

If there was a serious problem in my local community, the people here would come together to solve it (Would you say you strongly agree, agree, neither agree or disagree, disagree or strongly disagree).

An average value for social capital can be obtained by averaging across the values for the seven variables listed above to provide a single measure of social capital as an index that can be used in the income compensation model.

4.3. Instrumental Variables

The design of the research must suggest several alternative possibilities. Previous research suggests options for instrumental variables, almost all of them taken from the Eurobarometer on Sport and Physical Activity (2018). The logic of the instruments is that they can be highly corelated with sport volunteering but not so much with Social Capital or Subjective wellbeing. Some of these variables include:

A. Are you a member of any of sport or fitness club?
B. How much do you agree or disagree with the following statement?

The area where I live offers me many opportunities to take part in sport /volunteering. Answers are attached to numerical values (Strongly agree 5 to strongly disagree 1)

C. Other variables that can be used as instruments (taken from Eurobarometer) include:
   - ‘measure of sport supply’,
   - ‘frequency of attending sport events’,
   - ‘perceived benefits of sport by individuals’.
   - ‘Distance of the respondent from a sport facility’
   - ‘How many times did you attend a sport event in last year?

The above questions would generate variables that can be used as instruments in the models of income compensation. For practical reasons a survey won’t have the luxury of incorporating all of them but may include two or three based on previous experience.

Providing that there is a questionnaire design that allows a choice between possible instrumental variables (IV) the first task of the researcher is to identify, based on data, which IV best fits the pattern and negotiates the problem of causality embedded within sport volunteering and wellbeing. The choice of IV needs careful consideration from as early as in the design of questionnaire and it is one of the most difficult problems to be negotiated in the monetisation of wellbeing.

4.4. Income compensation model

The model of Income compensation is the same for both Subjective Wellbeing (SWB) and Social Capital. To avoid repetition, we show the case of SWB. Social Capital would involve the substitution of one variable for the other.

SWB increases by rises in both income and engagement in sport volunteering (otherwise the people in question would not have volunteered). Assuming that sport volunteering increases by one unit, then in order to keep SWB constant income has to compensate (by declining, hence IC).

The general theoretical model is :

$SWB_i = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 E_i + \beta_3 X_i + \varepsilon_i$

Where:

SWB_i is individual i's SWB;

$\ln(Y_i)$ is the natural logarithm of household income;

E_i is engagement in sport volunteering;

X_i are personal and social characteristics and

ε_i is the error term.

The chapter that elaborates the methodological tools of wellbeing, shows that income compensation (for an increase in sport volunteering) is derived as:

$IC = \bar{Y} - e^{\left\{\ln(\bar{Y}) - (\frac{\beta_2}{\beta_1})\right\}}$.......................(1)

Mean income may be derived from the survey. Hence, the question becomes 'how to estimate the coefficients β2 and β1 in equation above'.

The theoretical foundation of the estimation can be found in the Centre for Economic Performance discussion paper by Daniel Fujiwara (2013) ' A General Method for Valuing Non-Market Goods Using Wellbeing Data: Three-Stage Wellbeing Valuation' (http://cep.lse.ac.uk/pubs/download/dp1233.pdf)

Within this discussion paper a three-equation method is suggested to overcome a bias in the results when a single Instrumental Variable equation is used. In this discussion paper it was shown that measures close to income compensation (in this case Equivalent Surplus) would decrease from almost £23,000 under a single pooled-OLS model to almost £7,500 under the suggested three equation IV model.

The model formulation is the following:

Equation 1:

$$\log(Income) = c + \alpha_1 IV + a_2 Z + \hat{\theta}$$

where IV is the instrumental variable, Z is a vector of demographic characteristics and c is a constant. This equation derives the residual vector $\hat{\theta}$ which is then used in equation 2 below.

Equation 2:

$$SWB = c + \beta_1 \log(income) + \gamma_1 X + \gamma_2 \hat{\theta} + \gamma_3 \hat{\theta} \log(income)$$

where X is a vector of demographic characteristics.

From this equation the coefficient β1 is derived as shown in model (1) before.

Equation 3:

$$SWB = c + \beta_2 P + \gamma_2 \log(income) + \gamma_3 X$$

where X is a vector of demographic characteristics and P is a participation variable (in this case in sport volunteering).

From this equation the coefficient β_2 is derived as shown in model (3) before.

Several estimation methods can be used. The ones used in the case of evaluations in Australia and Belgium were OLS for Equation 1 and Ordinal regression (with probit function) for Equations 2 and 3.

Then by using the values of $\beta_{2,}$ β_2 and $\bar{Y}$, we can estimate the amount of income one has to miss in order to keep SWB constant when participation in sport volunteering increases by one unit.

As mentioned before, exactly the same process can be followed in the evaluation of a monetised impact on Social Capital. As in the case of SWB, the underlying assumption is that increases in income and sport volunteering will lead to rises in Social Capital through greater networking of the individuals in question.

The income compensation approach will provide monetisation of wellbeing at the level of an individual sport volunteer. This average has to be aggregated across all volunteers to derive the final impact of sport volunteering in a country.

5. References

Fujiwara (2013): A General Method for Valuing Non-Market Goods Using Wellbeing Data: Three-Stage Wellbeing Valuation, Discussion Paper, Centre of Economic Performance.

Miller, Ronald E., and Peter D. Blair (2009): *Input-Output Analysis - Foundations and Extensions*. 2nd editio. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, Sao Paolo, Delhi, Dubai, Tokyo: Cambridge University Press.

evisproject.eu