

# Intervals: addressing misleading methods of measuring the economic value of volunteering

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### Abstract

There is an increasing demand for assessing the value of volunteering. This trend is connected with using of plenty of methods, offering significantly various results. Even though there are qualified estimates, there are all point estimates. These estimates are not taking into account the deviation apart from the chosen replacement wage. The article wants to emphasize, that the deviation of these estimates compared to real value, could be significant. That it is the reason why it is coming with the concept of interval representation. The interval range of the economic value of volunteering. It can help us to understand that we do not know the exact value of volunteering. The ones who are computing the point should be aware of that. Choosing the replacement wages can influence the value of volunteering significantly. The article is showing how different methods can be used, compared and how interpret their results.

## **Introduction**

Interest in measuring the economic value of volunteer work has been growing in recent years. Determining the value of volunteer work can be particularly useful when projects are co-financed with non-financial contributions, or in satellite account of non-profit institutions and volunteering. The economic value of volunteer work can be integrated into tax records. Volunteer work is a segment of the economy that should not be ignored when calculating gross domestic product indicators – the estimated worldwide value of volunteering is about 1, 348.1billions USD. Other reasons for determining the value of volunteer work are that it enables more effective management of volunteer work, it is motivating the people to volunteering or it can help with generating support for policies that could bolster volunteer effort. (Salamon, Sokolowski and Haddock, 2011).

For these reasons and others, a number of methods and manuals for determining the economic value of volunteer work, such as the ILO manual, have been proposed (ILO 2011). Replacement wages are currently usually used to evaluate volunteer time.

At present, all the methods available for determining the economic value of volunteer work are point estimates, which means they provide a single figure as a result. Each method leads to a different figure and the differences between the figures can be dramatic. It should be kept in mind that although these estimates are expressed as one exact figure, the actual values are very likely not one exact figure at all (considering the number of methods generating different results). There are too many simplifications and generalising elements in the evaluation methods, leading to distortions. For example, the method based on general wages, in which the value of volunteering is calculated as the time worked by volunteers, is evaluated with a single, unified price. This is a source of distortion, because, as in the market economy that is the source of the data used to measure the economic value of volunteering, workers do not work for one and the same wage. This applies regardless of whether we choose the median or average wage as the single price for volunteer time. The specialist method is closer to reality, as it evaluates volunteer time using different prices depending on the type of work. However, even workers in the same profession do not earn the same wages. For this reason, we use the average or median values per occupation, which means that not even the specialist wage method exactly expresses the value of volunteering. The income approach to calculating GDP would similarly show significant distortions if it evaluated all the work done in one profession group using a single wage or salary rate, because the wages for one type of work are not the same (Dostál 2014).

The purpose of this paper is not to question the meaning of point methods or estimates; there are a number of good reasons why only one figure should be used (e.g. in the field of co-financing) despite some distortions. The objective is to point out the inaccuracy of these point indicators and the differences in their results. They may provide valuable general information about economic value of

volunteering, but they do not reflect an exact calculation of the economic value of volunteering, expressing it as a specific amount of monetary units (euros, dollars, etc.), as this is almost impossible with the current methods.

## **1. Proposed approach: interval representation of the economic value of volunteering**

In order to determine the interval that contains the closest equivalent value of volunteer work, it is necessary to determine the lower and upper limit of the interval. These boundaries should represent the two extreme limits of the volunteer work values: at the lower extreme, all the workers replacing volunteers would work for the lowest price at which it is possible to work in the given economy; at the upper extreme, all of them would work for the general replacement wage that would be paid to hired professionals, including mandatory contributions and benefits, i.e. the additional costs incurred beyond the regular wage paid to a standard qualified worker who performs the same work or similar tasks as a volunteer. According to our observations, the value of volunteer work must be found somewhere between these two points, i.e. above the point below which the work cannot be valued and under the point at which the respective volunteer work would be performed by a full-time hired professional with all the benefits and advantages available in the given profession.

Our proposed interval representation of the value of volunteer work basically combines several evaluation methods, where the two extremes represent the interval boundaries and the other points are located inside or outside of the interval, depending on how fair the value is that results from their calculation based on the provided data. The most commonly used methods that we have come across and at least partially incorporated into our interval are summarized in Figure 1.

**Figure 1: Methods of measuring the value of volunteer work**

Basic methods:

- **Minimum wage** – said to provide a minimum estimate; however, many countries have more than one level of minimum wage
- **Median wage** (one median replacement wage) – used by the Czech Statistical Office
- **Specialist wage** (median replacement wage for each type of volunteer work) recommended by the International Labour Organization

Other existing methods:

- **Guaranteed wage** – **several levels of guaranteed minimum wage**, according to the type of volunteer work; this method combines minimum wage and specialist wage methods
- Method of Czech Ministry of Labour and Social Affairs – the replacement wage is equal to **6th wage class and 6th wage level** of the “Wage Tariff Scale”
- Tošner and Sozanská’s method – the replacement wage is equal to **minimum wage times 1.5** (Tošner and Sozanská, 2002)
- University of Economics (VŠE) in Prague – one generalist wage, reflecting the structure of volunteer work in the Czech Republic is used as a **weighted average** of substitute wages for volunteers (Novák, 2008)
- **Average wage** – close to the median wage, using the average wage in the particular economy as the replacement wage
- Independent Sector – from the USA, this method increases the level of the replacement (**average**) wage with the estimated level of the **fringe benefits** (12%). The fringe benefit level was estimated for the USA, making its use in other countries very problematic, because fringe benefits differ from one country to another. However, the basic concept of increasing the replacement wage by including fringe benefits is logical and was thus incorporated into the concept of interval estimate.

Source: Dostál (2014), based on Novák (2008), Tošner and Sozanská (2002), CSO, and MoLSA

#### Determining the lower limit of the interval estimate

It is easier to determine the lower limit of the interval because there is a minimum wage required by law in the vast majority of countries. If there is a minimum wage, it would not be legally possible to employ workers who could hypothetically replace volunteers for a lower wage. However, the minimum wage is not necessarily expressed as a single amount. There are four specific types of minimum wage:

- specific minimum wage by occupation
- specific minimum wage by sector
- specific minimum wage by region
- minimum wage levels for specific categories of workers

In many countries, including the Czech Republic, there is a guaranteed wage. In the Czech Republic, there are eight wage rates for which it is possible to legally employ workers, depending on the nature and intensity of their work. It is possible to find a substitute minimum (guaranteed) wage based on

type of volunteer work. Another option would be to use the average or median wage for the lowest-paid job. This option would be particularly suitable for countries without a fixed minimum wage. The option of using the minimum cost of living, which would be suitable for countries with high levels of illegal employment, can be considered because it is based on how much money people need to earn in order to meet their minimum living expenses.

There are several proposed variants for the lower limit:

- 1) The guaranteed wage (a combination of the minimum wage and the specialist wage – the term used in the ILO database is the specific minimum wage by occupation, or by sector in absence of an occupation)
- 2) Minimum wage
- 3) The average or median wage for the lowest-paid job in the economy
- 4) The wage needed to cover the minimum cost of living

The order of the presented options corresponds to the order in which they should be applied.

Formally, we record the lower limit of the interval as follows:

$$v_i^d = \sum_{i=1}^n h_i * w_i^d$$

$$i = (1, 2, 3, \dots, n)$$

Where:

$v_i^d$  The economic value of volunteering at the lowest possible wage (variants 1-4 above)

$h_i$  The number of volunteer hours at the respective type of volunteering

$w_i^d$  The minimum (guaranteed) wage in the respective profession (variants 1-4)

$i$  Volunteering type

If the country has different minimum wages assigned to different activities and sectors, it seems logical to use those because it would not be possible to employ workers to carry out the given activity at a lower rate. If there is just one minimum wage in the economy, this one should be used. If the minimum wage is not fixed, as infrequently happens, the average or median wage for the lowest paid occupation in the given economy should be used. If not even a minimum wage is determined and there are no work statistics available, an estimate of the minimum cost of living in the given economy can be used, converted to the wage for one hour of work in the context of the standard work day and week in the given country (see Guzi 2013).

### Determining the upper limit of the interval estimate

The determination of the upper limit of the interval estimate is somewhat more complicated because there is no maximum acceptable wage for which it would be possible to employ workers. An alternative solution could be the index-related salaries of government employees.

Normally, the median wage for the whole market or only the non-profit sector is used to determine the point estimate of the economic value of volunteer work, which also applies to the Czech Republic. Table 1 uses the example of the Czech Republic to show the disparity of salaries in the population and the differences when the mean and median values are applied.

**Table 1: Differentiation of salaries (non-profit sector) in the Czech Republic for 2013**

Differentiation	CZK/month	CZK/hour
1st decile	14,210.00	81.70
Average	25,940.00	151.80
Median	24,510.00	142.60
9th decile	37,520.00	223.00

*Source: adapted by the author on the basis of ISPV 2014*

Due to the inconsistent wages and salaries among individual professions and even among workers in the same profession in virtually all the countries with market economies in the world, it is very difficult to determine, within the interval of salary differentiation, the position of the point that should be the upper limit of the interval. It is misleading to apply a single wage to all professions. If data are available for individual activities, it seems more logical to apply data obtained for individual job groups, i.e. the specialist wage. In our view, the most suitable value for the upper limit of an interval is the median specialist wage for individual areas of volunteering, as recommended by the ILO, increased with fringe benefits in the manner of the US Independent Sector. However, these fringe benefits should not necessarily be calculated at 12%, which is the value determined for the USA, but at the rate applicable in the given country. We consider this to be an acceptably extreme value which is unlikely to be exceeded by the value of work done in a real economy. It is unlikely that all the market alternates for volunteers would receive full insurance and employee benefits because they could often be hired to do the volunteers' work under other types of contracts or as part-time jobs with fewer or no benefits, resulting in a lower cost of alternates for volunteers. Since this is the upper interval, however, we can afford to increase all wages with social security and health insurance contributions and benefits. To bring the value of volunteer work closer to its assumed market price, we choose the specialist wages, as we consider a single rate unified for all types of work to be unsuitable. It is necessary to allow for different wages based on individual activities.

The category of benefits includes both mandatory contributions (health and social insurance) and voluntary contributions (typically a car or a mobile phone used for private purposes, meal vouchers, language courses, travel allowances, etc.). In the Czech Republic, the compulsory contributions from

which the benefits awarded under law are paid constitute a considerable component of wages. Considering the absence of data about voluntary benefits, only the benefits awarded under law were selected for expressing the value of volunteer work in the non-profit sector. In the Czech Republic, these benefits will be the mandatory contributions paid by the employer, i.e. health insurance (25%) and social insurance (9%), which amount to 34% in total. The obligation to pay these contributions is tied to an employment relationship and, to a wage limited extent, other variants of employer-employee relationships. For example, Czech Republic has three types of employer-employee agreements. Each one with different limits of working hours, wage and even with different taxation and obligatory insurance, it's even possible sometimes, for shorter time, employ worker with zero insurance cost. In any case, it is possible to employ a person without these benefits under certain conditions.

The upper limit of the interval representation of a value has several variations, arranged here according to the suitability of their use:

- 1) Median specialist wages plus fringe benefits
- 2) The median wage in the economy plus fringe benefits
- 3) The average wage in the economy plus fringe benefits

If data on the type of volunteer work and data on wages in individual professions are available, the best and probably the most accurate variant is the specialist wage increased by fringe benefits in the given country. If these data are not available, we will use the median or average wage in the economy, however we must reckon with an increasing distortion of results.

$$v_i^u = \sum_{i=1}^n h_i * w_i^u$$

$$i = (1, 2, 3, \dots, n)$$

Where:

$v_i^u$  The economic value of volunteering where the specialist wage is used (variants 1-4 above), plus fringe benefits

$h_i$  The number of volunteer hours at the respective type of volunteering

$i$  Volunteering type

## 2. Interval representation in action

This chapter will demonstrate how interval representation can be used to represent and compare the values of volunteer work.

We will demonstrate the determination of an interval using data from a hypothetical example; however, the data structure and volume were inspired by data from a real study of the economic values of volunteer work that was carried out concerning Czech ADRA, an organization that arranges volunteer work in many industries. (Dostál, Vyskočil 2014a) First, we determine three variants of volunteer organizations that we will use to demonstrate the function of an interval. Most of the variants are based on real volunteer organizations performing volunteer work in different areas, but with hypothetical numbers of hours. Details are given in Table 2.

**Table 2: Variants of volunteer organizations and their activities**

<b>Variant 1 ADRA Frýdek-Místek</b>		<b>(CZK wages)</b>	
Type of work	Hours	Specialist hourly wage (CZ-ISCO)	Guaranteed hourly wage (GW)
Social services	9,800	115	58
Assistance	200	95	50
Educational work	350	175	72
Manual work	6,900	80	53
Cultural activities	250	86	64
Total hours	17,500		
<b>Variant 2 iQ Roma</b>			
Type of work	Hours	Specialist hourly wage (CZ-ISCO)	Guaranteed hourly wage (GW)
Social services	2,500	115	58
Assistance	0	95	50
Educational work	5,800	175	72
Manual work	0	80	53
Cultural activities	1,750	86	64
Total hours	10,050		
<b>Variant 3 Labour volunteers</b>			
Type of work	Hours	Specialist hourly wage (CZ-ISCO)	Guaranteed hourly wage (GW)
Social services	0	115	58
Assistance	0	95	50
Educational work	0	175	72
Manual work	20,000	80	53
Cultural activities	0	86	64
Total hours	20,000		

Source: prepared by the authors on the basis of data from the Czech Statistical Office and the Ministry of Labour and Social Affairs

The table shows three variants. Variant 1 is the ADRA volunteer centre in Frýdek-Místek, Czech Republic. We assume that it would perform a wide range of works in the field of social services, particularly including volunteer assistance at homes for the elderly and nursing homes. Some volunteers help to provide personal assistance in client (mostly senior citizens’) homes, others help to provide tutoring and catch-up classes to socially disadvantaged people, others work at charity shops and other facilities as manual workers and others organize cultural events and entertainment. The range of services is varied but manual labour and work at social services facilities represent the major percentage of the total work.

Variant 2 is the iQ Roma organisation, operating in the field of integration and education of vulnerable minorities in the Czech Republic. It provides educational, social, and cultural activities, with educational activities accounting for the major share of its operations.

The third variant is the simplest one. It is a program that organizes only large-scale manual labour, for example for addressing natural disasters.

In addition to the worked-out hours, Table 2 shows hourly wages for each category of work to which we have assigned values according to the MoLSA statistics, broken down by the work types of CZ-ISCO. The wages assigned to individual types of work according to the Guaranteed Wages in the Czech Republic are also listed. We will not deal with the assignment methodology itself because this has been addressed in many other studies, including the ILO manual and our papers entitled “The Economic Value of ADRA’s Volunteer Centre Volunteering” (Dostál, Vyskočil, 2014b) and “The Economic Value of Volunteering: ADRA CZ in 2013”[in Czech] (Dostál, Vyskočil, 2014a).

**Table 3: Wages (CZK)**

Minimum wage	50.6
Median wage	126.42
Average wage	153.94
MoLSA	68.72
University of Economics	144.52

Source: Prepared by the authors with data from CSO, MoLSA, and the University of Economics

Table 3 provides additional information about the values of the wages applied by the general methods using a single value to evaluate volunteering time. The table clearly shows the importance of the choice of the value in the Czech environment and the differences in the results reached through applying various values. The median, average, and minimum wages were taken from the statistics of the Czech Ministry of Labour and Social Affairs of the Czech Statistical Office. The value marked as MoLSA represents the 6<sup>th</sup> grade of the 6<sup>th</sup> salary bracket according to the tables of salaries of civil

servants in the Czech Republic (= the valuation method of the Czech MoLSA). CZK 144.52 is the value calculated by weighting the average wages according to the determined structure of volunteering by the University of Economics in Prague, Czech Republic (Dostál 2014).

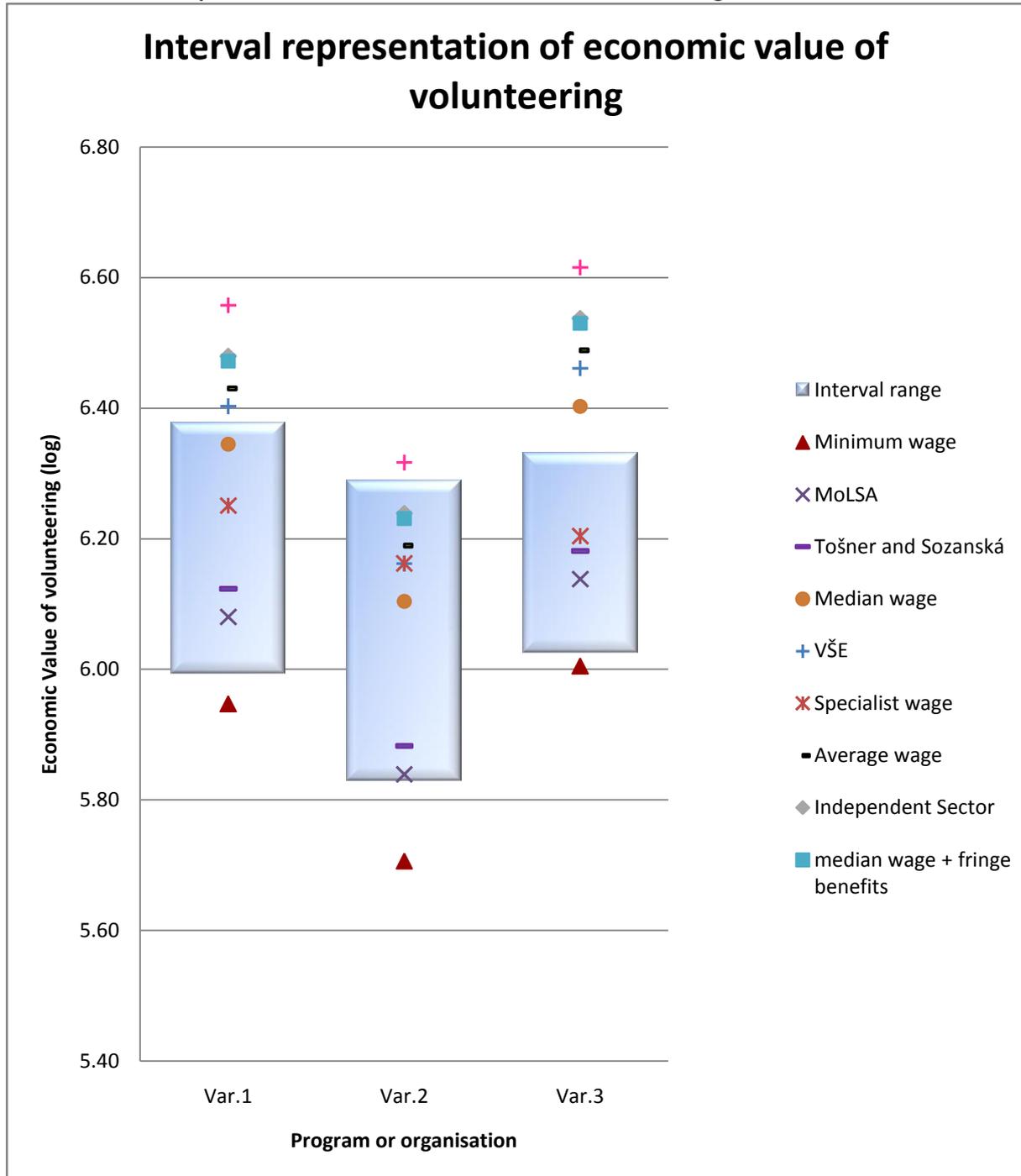
**Table 4: The table of methods and the interval**

Measurement method		Variant 1		Variant 2		Variant 3	
Minimum wage		885,500	x	508,530	x	1,012,000	x
<b>Guaranteed wage</b>	<b>MIN</b>	<b>985,300</b>	<b>---</b>	<b>674,600</b>	<b>---</b>	<b>1,060,000</b>	<b>---</b>
MoLSA		1,202,600	o	690,636	o	1,374,400	o
Tošner and Sozanská		1,328,250	o	762,795	o	1,518,000	o
Median wage		2,212,350	o	1,270,521	o	2,528,400	x
University of Economics		2,529,100	o	1,452,426	o	2,890,400	x
<b>Specialist wage</b>	<b>ILO Rec.</b>	<b>1,780,750</b>	<b>o</b>	<b>1,453,000</b>	<b>o</b>	<b>1,600,000</b>	<b>o</b>
Average wage		2,693,950	x	1,547,097	o	3,078,800	x
Independent Sector (12%)		3,017,224	x	1,732,749	o	3,448,256	x
<b>Specialist wage plus fringe benefits (34%)</b>	<b>MAX</b>	<b>2,386,205</b>	<b>---</b>	<b>1,947,020</b>	<b>---</b>	<b>2,144,000</b>	<b>---</b>
Median wage plus fringe benefits (34%)		2,964,549	x	1,702,498	o	3,388,056	x
Average wage plus fringe benefits (34%)		3,609,893	x	2,073,110	x	4,125,592	x
<b>Interval width</b>		<b>1,400,905</b>		<b>1,272,420</b>		<b>1,084,000</b>	

Source: Prepared by the authors

Table 4 is the basis of our interval representation, showing the highlighted interval boundaries (MIN, MAX), the specialist wage method recommended by ILO as the most accurate. The symbols "x" and "o" stated for each of the variants indicate whether the results of the method fall within the interval determined by us. The interval width is specified as the difference between the upper and lower limits. Chart 1 was created on the basis of Table 4, showing three intervals and the results (marked with points) of the applied methods of calculating the economic value of volunteering. We used the value of 12% of fringe benefits for the Independent Sector method, although we consider it to be intended only for the USA; the reason for using it is that, at least in the Czech Republic, this method is presented and applied with the original benefit rate of 12%, although it is unclear whether this is due to a misunderstanding or another reason.

Chart 1: Interval representation of the economic value of volunteering



Source: prepared by the authors

To interpret Chart 1, it is helpful to review the three variants representing volunteer programs. Variant 1 is the most varied program, with a lot of hours of social work, manual labour, and minimum educational and cultural work. The majority of hours under Variant 2 is worked out in the education field and the third variant represents only manual labour. We know from the previous tables that wages in the professions that could replace the volunteers are the highest in the field of education and the lowest in the area of manual labour. This strongly affects the size of the interval, the lower limit of which is derived from the guaranteed salary, while the upper limit includes benefits that are much

higher for education than for manual labour, though the guaranteed wages do not differ so much among these professions. The minimum wage method generates results with even more significant differences, causing considerable undervaluation to the programme with volunteers performing as substitutes for the most expensive employees. This occurs because there although are fewer volunteers in this area with fewer worked-out hours, the worked-out hours are assigned the same value as hours of unqualified manual work where there are more hours and volunteers. The results generated by the other methods are shown on the opposite side of the interval. It is particularly clear that the results go beyond the interval for variants 1 and 3 when the average and median wages with benefits are applied. This occurs because both values, the median wage and average wage for the whole sector, are higher than the wages that the programmes deserve proportionally to the structure of the performed activities. The only exception is the second variant. Its educational programme, with correspondingly more expensive professions, is evaluated at a rate higher than the rate specified by the median; although the average for the whole sector is outside the interval, the difference is much lower than in the remaining variants.

In Chart 1, we demonstrate that the application of various methods can distort information and influence decisions about public subsidies, project selection, etc. In applying nearly all the methods, the most likely project to be selected for support would be Variant 3; however, its actual value would be strongly overestimated by most of the methods. Different methods can generate different results that may affect our decisions. Creating a chart that shows the results of these different methods can help to reach better decisions and not to neglect weaknesses of some of the applied methods. The length of the interval and dispersion of the methods points in the chart warns against inaccuracies and problems associated with the measurements. For example, when comparing the values of the same projects having the same structure of volunteers, we would not have to fear selecting an inappropriate project, only of overestimating or underestimating it, but the order of the projects with the same structure would have to be the same in the outcome according to all the methods. However, if there are different structures of volunteer work, the risk exists that a certain underestimated or overestimated activity will influence the overall value of the project and the results will differ depending on the method of project selection. In applying most of the methods, the winning variant in Chart 1 is Variant 3, but if the upper interval limit was applied as the determining method, Variant 1 would win.

## **Conclusion**

The paper provides a brief description of the methods discovered by the authors based on the replacement wage, differing mainly in the extent of the required input data, whether the authors required only worked-out hours or hours divided by the type of work that they multiplied by the price of a worked-out hour depending on the method. They applied the median, average, minimum, or otherwise specified wage, increased or not increased with benefits. The paper does not deal with any deeper justification of individual methods, which are adequately described in other literature (e.g. Salamon, Sokolowski and Haddock, 2011; Connors et al, 2011; Novák 2008, Anderson and Zimmerer, 2003; Anheier et al, 2003 or Goulbourne and Embuldeniya, 2003).

The objective of the paper was neither to defend nor to refute any of the methods or arguments supporting them. It simply compared their impacts and drew attention to their differences, which can be overlooked when NGOs, public authorities or even the researchers dealing with the value of volunteering choose only one “preferred” method without trying to compare the result with results from other possible methods.

The authors constructed an interval of their most realistic estimate based on the two most detailed methods, i.e. the method of the guaranteed minimum wage, which varies depending on the profession, and the specialist wage method increased with benefits, which requires data about volunteering in the breakdown by activities, ranking it among the more complex and demanding methods. The results of the other methods, simpler ones or those based on a different theory, were shown in comparison with the interval, using three different, semi-hypothetical variants as examples, to demonstrate how an evaluator, legislator, or subsidy donor can find misleading results that differ depending on the method and evaluated variants and particularly on the structure and the scope of volunteer work. The paper draws attention to the fact that much more precise results can be reached when specialist wages, i.e. more wage rates, are applied rather than general wages of any type. General wages, depending on the proportion of the professions for which a wage higher or lower than the general wage is found separately, lead to distortion. Depending on the difference between the general wage and the specialist wage most represented in a sample, the project can be considerably overestimated or underestimated. It was shown how minimum wages and lower general medians underestimate the projects that may have fewer worked-out hours in the fields that are more demanding. Causally, average wages for the whole economy overestimate projects with many worked-out hours but in less-valued sectors in the form of manual labour.

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