# I. DEBIUTY EKONOMICZNE / ECONOMIC DEBITIONS

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# SOCIAL SUSTAINABILITY IN AGRICULTURAL FARMS IN FADN EUROPEAN REGIONS

JEL codes: Q01, Q56, J43, O13

**Summary:** The aim of the paper was to identify different levels of social sustainability in all FADN European regions. The study is based on the Sustainable Value (SV) method, which is value-oriented, measured as the sustainability of agriculture at the micro-economic level (e.g. agricultural farm). To be able to compare farms among themselves, an RTC was calculated. The FADN database for the years 2004-2015 was used in the article, analyzing farms in all regions. It identifies regions, where farms made a positive contribution to social sustainability and those, compared to the EU average, which need mainly institutional support in order to bridge the gap with the best.

Key words: social sustainability, agricultural farms, the EU regions, FADN.

### **1. INTRODUCTION**

Sustainable development is most often analyzed in its economic, social and environmental aspects [Zegar 2012, Kates et al. 2005]. The social sustainability on which the authors have focused is primarily seen in terms of employment and income. Employment is regarded both in quantitative terms when the employment rate increases, and in qualitative terms when the skills of the workforce are upgraded. Many authors stress the importance of increasing employment in rural areas (supported, among others, by Community funds), which is strongly correlated with the decreasing rate of social exclusion, and thus increasing social governance, by reducing depopulation of these areas and improving the quality of life [Chatzinikolaou et al. 2012, Subić et al. 2013, Basiago 1999, Weingaertner and Moberg 2009]. For example, Torres et al. (2016) indicated that running ecological farms improves the situation of the local community and is particularly desirable in areas characterised by relatively high unemployment, thus increasing their social order. Also the quality of employment, i.e. qualifications and education, as well as human and social capital in a broad sense are strongly linked to social sustainability, as they have a direct impact on the income of the agricultural population [Czerna-Grygiel 2010, Wolz et al. 2006, Knapik 2014, Latruffe et al. 2016, Flora and Roesch-McNally 2014]. The income aspect is also raised in a different context – as a result of sustainable farming. Examples from various countries (Argentina, Austria, Bulgaria and other developing countries, including the Third World) show that sustainable agriculture is better than industrial agriculture because it does not have a negative impact on the rural population, impoverishing farmers and thus depriving them of opportunities for development [Gizicki-Neundlinger and Güldner 2017, Bachev 2017, Severi 2016, McKenzie 2004, Berlan 2013, Kwasek et al. 2015]. Others [Bacon et al. 2012, Hediger 2008] note that, inter alia, sustainable agriculture reduces some of the social costs of industrial farming, in particular the exposure of workers and rural communities to pesticides, while at the same time leading to an overall improvement in the quality of life in rural areas, maintaining cultural traditions and biodiversity, including through appropriate investment [Bock 2012]. Simultaneously, in a wider context, it is an element of territorial development, which in turn leads to sustainable social development [Hediger 2008, Wilson].

#### 2. MATERIAL AND METHODS

The aim of the paper is to indicate the differentiation of the level of social sustainability in all FADN European regions (from 122 in 2004 to 134 in 2015). We will use Sustainable Value (SV) method, which is a value-oriented method, developed as a means of measuring agricultural sustainability at microeconomic level (e.g agricultural farm). This enables a synthetic assessment of a farm's contribution to farming sustainability, taking into account the efficiency resulting from using economic, social and environmental resources in comparison to the opportunity cost [Figge and Hahn 2005, Illge et al. 2008, Van Passel et al. 2007]. As noted above, the authors pointed to one of the pillars of sustainability – social sustainability. The calculation formula for determining the SV of farms in the regions needs to indicate a benchmark farm, which was the average value of variables adopted for the analysis for the analysed EU regions. The calculation formula for determining the SSV of the farms is as follows:

$$SSV_i = \frac{1}{m} \sum_{j=1}^m r_{ij} \left( \frac{y_{ij}}{r_{ij}} - \frac{yb_{ij}}{rb_{ij}} \right)$$

SSV<sub>i</sub> is the social sustainable value afferent to a farm from region *i*;  $r_{ij}$  and  $rb_{ij}$  represent the resource quantity of type *j* and region *i* of the analysed farm, i.e. of the farm considered as reference system;  $y_{ij}$  and  $yb_{ij}$  are the return of resources of the analysed and benchmark farm; *i* = 1...n is the region and *j*=1...m is the type of analysed resource.

Through its contents, SSV indicates the absolute size of the value created in a sustainable manner by the agricultural farms in each region of the EU. To take into account the size effects and to make comparisons between farms of various regions, we can calculate the indicator *Return to cost ratio* (*RTCi*). This one shows the relative contribution of farms from various countries to the sustainable performance compared to the benchmark:

$$RTC_i = \frac{y_i}{y_i - SSV_i}$$

where  $y_i$  represents the created value (farm net income);  $SSV_i$  – social sustainable value of the average agricultural farm of region *i*.

The FADN database for the years 2004-2015 was used, analyzing in all EU regions. We use the following variables as an input indicator: unpaid labour input (SE015), paid labour input (SE020), wages paid (SE370) and as an output: farm net income (SE420).

#### **3. RESULTS**

The conducted analyses indicate that the calculated RTC value for average farms in the EU regions allows for their delimitation to those where the rate is relatively high, above 1, such as in Lombardia and Wallonie or several Spanish regions (cf. Table 1). These regions can therefore be considered as making a positive contribution to social sustainability from their farms. This means that the ratio of the allocated outlays and effects is higher than the average in the EU-27. For comparison, in the two best regions (Lombardia and Wallonie) unpaid labour input (family work) is average 1,4 FWU during analysed 12-year period (and only 0,22 AWU paid labour input). Therefore the total work input is approx. 1,6 AWU. At the same time, such involvement of labour allows to generate over 150 thousand euro of total production and income from family farms equaling 72.5 thousand euro on average annually for Lombardy and about 47.8 thousand euro for Wallonie, respectively.

The relatively worst situation is observed in farms, which are located in some Bulgarian, Czech and German regions, where the RTC indicator for the selected research period is relatively low, below 1. In agricultural farms in the regions closing the ranking (Slovakia and Thueringen) the unpaid labour input (family labour input) is relatively low and equals about 1 FMU, however, it is worth noting that there is one of the highest the labour input in the EU (in Slovakia respectively about 15 AWU and in Thueringen about 9 AWU averaged annually in the analyzed period). It should be noted that the regions which are at the end of the ranking are mainly large field farms (eastern German Länder, Slovakia and the Czech Republic) which operate as companies rather than as family farms. In addition, their agricultural activity is low-profit or loss-making, because despite relatively high total output (almost one million euro on average a year in Thueringen, or half a million in Slovakia), income is either negative (as in Slovakia) or

at the level of the analysed Wallonie (46.2 thousand euro), however, with a much higher involvement of the external factors, like paid labour.

Therefore, it can be concluded that agriculture in these regions requires institutional support that would allow for the improvement of qualifications, education and investment, which could have a positive impact on the efficiency of the labour factor.

Тор 10			Bottom 10		
Region	RTC	SSV	Region	RTC	SSV
Lombardia (ITA)	4,19	54552,4	Severen tsentralen (BGR)	0,26	-25644,5
Wallonie (BEL)	3,59	34386,3	Yugoiztochen (BGR)	0,26	-25266,8
Cantabria (ESP)	3,26	16461,5	Czech Republic (CZE)	0,23	-116710
Galicia (ESP)	3,12	16879,3	Yuzhen tsentralen (BGR)	0,21	-20426,1
Castilla-Leon (ESP)	2,86	15952,9	Yugozapaden (BGR)	0,19	-18658,3
Madrid (ESP)	2,79	21852,8	Denmark (DAN)	0,18	-41345,8
Piemonte (ITA)	2,78	19376,5	Sachsen (DEU)	0,17	-212007
Ireland (IRE)	2,61	12723,4	Brandenburg (DEU)	0,16	-213299
Austria (OST)	2,61	15451,3	Thueringen (DEU)	0,10	-343755
Lorraine (FRA)	2,46	25737,6	Slovakia (SVK)	0	-376319

Table 1. Average RTC and SSV (in euro) value for agricultural farms in the EU-27regions in 2004-2015

Source: own study based on [FADN 2004-2015].

Dynamic analyses were also made in the researched period, which generally show, that by 2008-2009 the position of the best regions in the EU had been growing (RTCs were growing), after which this trend had broken down, indicating a decreasing disparity in the level of social sustainability of agricultural holdings in the EU regions (cf. Fig. 1).



Figure 1. Average value of SSV for top 5 regions of EU-27 countries in the years 2004-2015





Source: own study based on [FADN 2004-2015]

The situation was different in the case of the lowest ranked farms – with a very low level of RTC and a negative SSV. The worst year for these farms was 2009, when all of them were unable to generate income from their activities (cf. Fig. 2). The reason for this was the global crisis. In 2009, farmers' incomes in the EU-27 fell by 11.6% on average in relation to the previous year, mainly due to the decrease in agricultural product prices, to which the largest commodity farms turned out to be the most vulnerable. After 2009, their income situation improved, but it is still relatively weakest compared to other EU regions. The worst situation in Slovakia has continued to be the case.

In summing up, farms from regions where there are relatively many large-scale farms in the agrarian structure, functioning as enterprises, seem to be the least socially sustainable. For comparison, the smallest farms are based primarily on their own, family labour resources, not taking advantage of almost completely employed work and not paying salaries to employees. It can be concluded that these are primarily family farms, which are part of the European agricultural model. [Davidova, Thomson 2014, Burja C., Burja V. 2016]. Depending on the region and country, they occupy a more or less significant place in the agrarian structure, however, they constitute a vast majority of the total EU population and although their income is relatively low, which may have a negative impact on social sustainability, too, but they perform many social functions (creation of jobs for owners and family members, protection against poverty, ensuring food security) and environmental (protection of agricultural land with high natural value, preservation of biodiversity and attractiveness of the area, shaping the rural landscape). On the other hand, the largest farms, most often organised in the form of enterprises or cooperatives, are mainly based on paid labour, generating usually satisfactory incomes [Bachev 2017], often being the only employer in rural areas. But we have exceptions to this tendency, when large farms are not able to generate a satisfactory income, as in the case of Slovak farms or the eastern German Länder.

#### **4. CONCLUSIONS**

The conducted analyses allow to identify regions, where farms make a positive contribution to social sustainability by considering the relation between the inputs (unpaid labour input, paid labour input, wages paid) and the results obtained (farm net income) in agricultural activity. Generalising it can be concluded that positive SSV, and thus RTC indicator above 1, in Italian, Spanish or French regions has been achieved. Unfortunately, most of the new EU-13 countries have a negative result of SSV, including the Polish regions (for the worst polish region Malopolska and Pogorze SSV= -4564 Euro, RTC=0,54). Dynamic analyses of the analysed period show that the absolute farms' position in the best regions is getting worse (average RTC is getting lower and lower), but in the case of the worst regions situation is relatively stable, like in Bulgarian and Romanian regions.

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**Streszczenie**: Celem artykułu było określenie poziomu zrównoważenia społecznego we wszystkich regionach europejskich FADN. Badanie opiera się na metodzie Zrównoważonej Wartości (Sustainable Value-SV), która jest zorientowana na wartość, mierzoną jako zrównoważony rozwój rolnictwa (w danym ładzie) na poziomie mikroekonomicznym (np. gospodarstwa rolnego) w wartości pieniężnej (w tym wypadku euro). Aby móc porównać gospodarstwa rolne między sobą, obliczono RTC. W artykule wykorzystano bazę danych FADN z lat 2004-2015, analizując gospodarstwa rolne we wszystkich regionach. Zidentyfikowano regiony, w których gospodarstwa rolne wniosły pozytywny wkład w zrównoważenie społeczne oraz te, w porównaniu ze średnią UE, które potrzebują głównie wsparcia instytucjonalnego w celu zniwelowania dystansu do najlepszych.

Słowa kluczowe: zrównoważenie społeczne, gospodarstwa rolne, regiony UE, FADN.

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