

# DOES EXTREME POVERTY OCCUR IN EU COUNTRIES?

Irena Antořová

**Abstract:** *Poverty as a result of income inequality is a concern for governments in all countries, including the European Union. The question is how serious the poverty is and in which households it occurs. This paper offers the identification of households at risk of extreme poverty based on the construction of the Extreme Poverty Index. This Index combines three dimensions of poverty, reflecting trends in measuring multidimensional poverty. The first component of the index is income poverty, the second is material deprivation of households, which complements the index by a non-income perspective and reflects the real living conditions of households. The third component of the index is the low work intensity of the household. Segments of households at risk of extreme poverty are identified in a cluster analysis using primary data from EU-SILC survey. These identified households should be the target groups of the social policy activities in order to make social policy and assistance to endangered households as effective as possible. The paper provides a comparison of extreme poverty in households in the Czech Republic, Germany, Poland and Slovakia. The most vulnerable segment in all countries is an unemployed pre-retirement consumer living alone, but also other household groups.*

**Keywords:** *Extreme Poverty, Income, Material Deprivation, Unemployment, Social Transfers, EU-SILC.*

**JEL Classification:** *I32, P46, D31, I31*

## Introduction

Life in poverty is no longer just a phenomenon of developing countries but also many economically developed countries, including European Union countries, which have to deal with this problem (Stiglitz et al., 2009). In economically developed countries the poverty is often described in the context of the income inequality which on the one hand drives the economy forward, but on the other hand causes households on the lowest income to live in poverty or in social exclusion and have to rely on state benefits. The instruments of state social policy lead to lower poverty however this depends on the suitable setting. As part of the fulfilment of the Europe 2020 strategy one of the objectives of the EU is to reduce the number of people living at risk of poverty (European Commission, 2010) and this endeavour needs to be quantified and verified.

Poverty and the living standard are highly complex concepts which can be regarded from a financial or non-financial angle. In case of the European Union the most commonly used scale of poverty is income poverty, the at-risk-of-poverty-rate, material deprivation and unemployment rate (European Commission, 2010). Financial and monetary indicators reflect the living standard objectively, the non-monetary (e.g. material deprivation) show the actual household living standards. This study offers a combination of them, i.e. offers a poverty indicator.

The aim of this paper is the determination and the identification of households living at risk of extreme poverty on the basis of the creation of the Extreme Poverty Index which combines several dimensions of poverty (income poverty, material poverty and low work intensity) in selected countries in the European Union. The identification of households

living at risk of extreme poverty will be made in the cluster analysis and compared in different countries also in the context of social transfers as a form of a state support.

## 1 Literature review

Income inequality is increasing globally and becoming the issue at the top of the policy agenda. Income inequality leads on the one side of society to the appearance of a low-income group that has a problem making ends meet and lives in poverty, in the worst case in social exclusion (Halleröd, Larsson, 2008). Chakravarty (2010) explains income inequality as the difference in income among the inhabitants within one population. Perkins et al. (2012) and Salverda et al. (2009) add that income inequality has a negative impact on the economy by reducing its performance.

Poverty in economically developed countries can take on several forms. The most commonly measured and discussed form of poverty in the EU is income poverty where insufficient income does not allow the household to achieve the required living standard (Stiglitz et al., 2009). The income situation of households affects also consumer behaviour. It is said that the influence of emotions on consumer decision-making is significant but the consumer's actions are still decided by what is in his wallet (Achar et al., 2016). Household's income situation is the basis for analysing the living standard where the household income encompasses income from employment or old-age pensions, social transfers and other income (Atkinson and Marlier, 2010). If the income of households is insufficient and its amount is below the poverty line, then these households are described as low-income. They are unable to behave according to their objectives due to lack of financial means (Haughton, Khandker, 2009).

Many factors which are interrelated create the living conditions of the household. For example, household income affects the standard of housing, work and life balance and health. Further correlation is significant between education and type of work, and between earnings, health and housing (OECD, 2011). Consumers can experience the poverty in various spheres such as lack of education, inadequate housing, bad health and malnutrition, low personal safety or social isolation (Alkire et al., 2015). The significant correlation between income poverty and poor health conditions was confirmed (Lenhart, 2019; Radulescu et al. 2012; Khan, Ul Husnain, 2019). The multidimensional poverty basically combines three dimensions: health, education and the living standard (UNDP, 2018).

The complex poverty can be objectively measured through household income, however this measuring testify nothing to what it is like being poor (Nolan, Whelan, 2010). Kuypers and Marx (2019) suggest to measure poverty not just according to household income but also according to assets. Measuring the quality of life based on a combination of monetary and also non-monetary indicators has its advantages (Whelan et al., 2003).

According to some authors (e.g. Rittakalio, Bradshaw, 2005; Atkinson et al., 2007) there are many determinants of poverty among which in the first place are the demographic factors of household members. Chaupain-Guillot and Guillot (2015) also showed that factors such as gender, age or education affect the level of household income. Aisa et al. (2019) see the education as the determinant of poverty. Corsi et al. (2016) explain the gender pay gap in EU countries given that women's and men's pay

differ for the same job. Gradín et al. (2010) speaks of discrimination against women which is growing and plays an important role in measuring poverty in the EU.

When identifying households at risk of poverty, Kis and Gábos (2015) see an important role in the characteristics of households as the age of their members, composition of households or socio-economic factors e.g. education, economic activity. The employment and unemployment affect the living standard too (Vojtková, Šoltes, 2018). Haralambie (2017) presents economic development, innovation and employment, as the main indicators of poverty in EU. Veneri and Murtin (2019) also see employment as an important factor determining the living standard. They regard employment as an income factor and propose adding another non-income factor (e.g. the health standard) in the prediction of the living standard.

Low-income households rely on state benefits. Sometimes they intend to use credit but their situation is even worse later because they are not able to repay (Li, 2018). Countries help low-income households with use of social policy instruments and thereby reduce income inequality. Without taxes and transfers income inequality would be far higher (Keeley, 2015). The precise identification of households at risk of poverty helps social policies to be effective (Halleröd, Larsson, 2008). If it is effective to focus social policy mainly on old age pensioners is a question (Kluge et al., 2019). However, social policies are in the competence of member states and the EU only provides a uniform objective (Stiglitz et al., 2009).

Kujala et al. (2019) stresses that poverty and income inequality need to be reduced because low-income households present a risk to others. Income inequality may lead to low-income households to criminal activity. Álvarez-Gálvez and Jaime-Castillo (2018) add that state social instruments also give a positive effect not just on safety in society and ensuring basic needs in low-income households, but also on the health conditions of consumers.

## 2 Methods

The primary data source for this paper is data from the EU-SILC survey (European Union - Statistics on Income and Living Conditions) from the year 2016. The EU-SILC data offers different types of income such as disposable household income or social transfers. The EU-SILC survey also allows the identification of households by socio-economics factors and provide information about detailed living conditions. This survey is compulsory for each member state in the European Union. The basic statistical unit in the EU-SILC survey is a household (Eurostat, 2019a). Krell and Frick (2017) add that it is possible to compare countries thanks to unified methodology and use this data in international research. The overview of a large number of respondents in the EU-SILC in 2016 is shown in Tab. 1.

**Tab. 1: Frequency of households and individuals in the EU-SILC survey in 2016**

Country	Number of households in EU-SILC	Number of individuals in EU-SILC
Germany	13 330	23 144
Czechia	8 507	16 157
Poland	11 982	27 131
Slovakia	5 738	14 101

*Source: own processing EU-SILC data*

The disposable income (DI) is considered the fundamental variable and is expressed monthly per an equivalised member of the household. This calculation takes into account the number of members in the household and also the age profile. The head of the household has a coefficient of 1.0, children under the age of 13 have 0.3 and other people 0.5. An equivalised household size (EHS) is calculated:

$$EHS = 1 + 0,5 * (n_{adult} - 1) + 0,3 * n_{child} \quad (1)$$

The equivalised disposable income (EDI) is determined according to the relationship:  $EDI = DI/EHS$  (Eurostat, 2019a). The equivalised income is in euro in this study. The income inequality is expressed on the basis of the comparison of average household income in the first income decile and in the last income decile. Deciles are quantiles that divide the dataset into ten equal parts.

The created Extreme Poverty Index contains three components: income poverty, material poverty and low work intensity. Income poverty is computed according to the methodology of EU. The initial part of this methodology is the poverty threshold determination. The poverty threshold is calculated as 60 % of the national median equivalised disposable income. If household equivalised income is below the poverty line, a household is considered as living at risk of poverty. EU methodology has defined a list of items that a household should afford. Those households who report four or more items missing from the list are considered severely materially deprived and living at risk of poverty (Eurostat, 2019b). The last component of the Extreme Poverty Index is the unemployment, especially low work intensity in a household that is defined as the number of people living in a household where the members of working age (18-59 years, students 18-24 years excluded) worked less than 20 % of their total potential during the previous 12 months. Work intensity is the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period (Eurostat, 2019c).

According to the Extreme Poverty Index, Households are living at risk of extreme poverty if they are below the poverty income threshold, if they are severely materially deprived and also if they have low work intensity. The identification of these households is made using the cluster analysis. The cluster analysis is applied to categorize objects in a data file into several groups (clusters). Objects within a cluster are as similar as possible and an object within a cluster with objects from other clusters is the least possibly similar. The individual objects are gradually merged into small clusters and then small clusters are associated with larger clusters (Meloun, Militký, 2012). IBM SPSS Statistics software is used in this study for processing EU-SILC data. The first step of the cluster analysis is called pre-clustering and sub-clusters are created. Sub-clusters from the first step are modelled on the entire data set in the second step (IBM Knowledge Center, 2019).

This study also offers an overview of social transfers in households as state support to households experiencing poverty. Then disposable income of households before social transfers and before social benefits is used to detect the amount of social transfers. Social transfers are calculated as a sum of social benefits and old age pensions.

### 3 Results

Four European Union member states: Germany, Czech Republic, Poland and Slovakia, were selected for making a more in-depth analysis of the problem of poverty and its dimensions for the purpose of composing the Extreme Poverty Index. Although these states are geographically neighbouring Central European countries and EU members, they are states with different economic performance, different economic development in the second half of the 20th century, varied levels of household income (Tab. 2), they all have to face poverty problem.

**Tab. 2: Income situation in selected countries in euros per month**

	Germany	Czechia	Poland	Slovakia
Average disposable household income	2 805	1 119	976	1 138
Average equivalised household income	1 936	707	560	617

*Source: own processing EU-SILC data*

The level of income in Germany is several times higher than in the other more eastern countries. For example, the average disposable income in Germany is about three times higher than in Poland and the equivalised income in Germany is almost four times higher in comparison to Poland. Income inequality is displayed also among households in the territory of the individual countries. The Tab. 3 shows how much disposable income of all households is in the first low-income decile and can be compared with the last income decile. The greatest differences appear in Germany where only 2.63 % of the income of all households falls into the first decile and in contrast almost a quarter of total income falls into the last decile.

**Tab. 3: Comparison of the first and last income decile**

	Share of the sum of income in the first decile of total income	Share of the sum of income in the last decile of total income
Germany	2.63 %	24.05 %
Czechia	4.20 %	22.05 %
Poland	2.81 %	23.75 %
Slovakia	3.36 %	20.73 %

*Source: own processing EU-SILC data*

#### 3.1 Determination of low-income households and extreme poverty

This paper offers the Extreme Poverty Index that combines poverty dimensions (income poverty, material dimension and low work intensity).

**Tab. 4: Poverty dimensions**

Poverty dimensions / states	Income poverty (IP)	Severe material deprivation (DEPR)	Low work intensity (LWI)	Extreme poverty (penetration)	IP + DEPR	IP + LWI	DEPR + LWI
Germany	16.42 %	5.01 %	9.01 %	1.87 %	3.69 %	6.22 %	2.11 %
Czechia	9.68 %	5.17 %	6.05 %	1.51 %	2.70 %	3.56 %	1.76 %
Poland	17.28 %	7.94 %	7.55 %	1.83 %	4.53 %	4.27 %	2.25 %
Slovakia	12.77 %	8.73 %	3.81 %	2.01 %	3.74 %	3.11 %	2.25 %

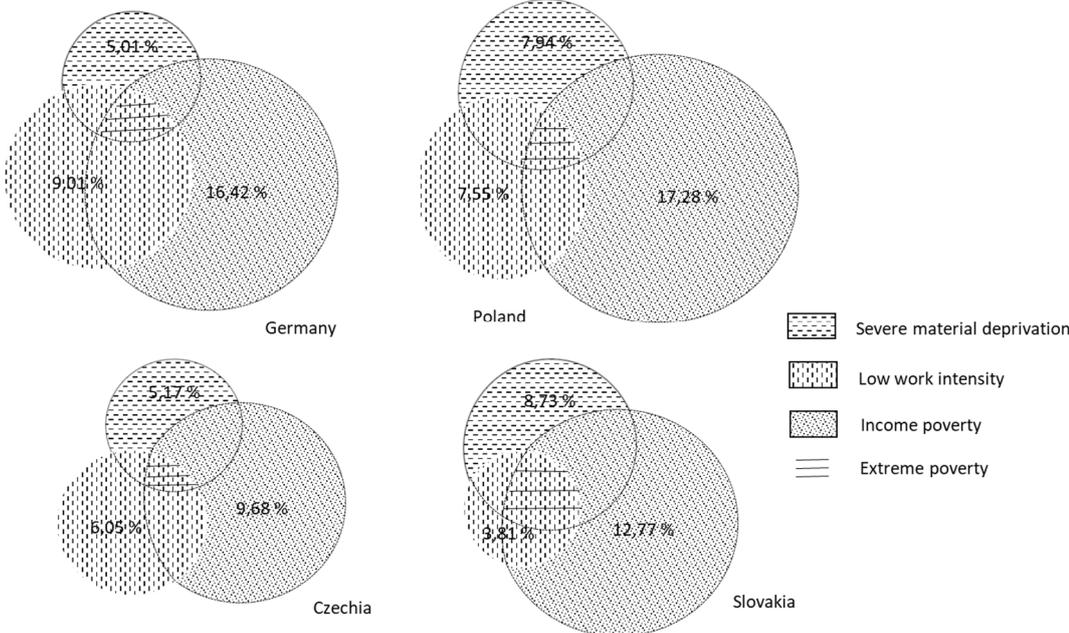
*Source: own processing EU-SILC data*

The Extreme Poverty Index is a penetration of three compositions of poverty expressing the share of the population which also lives in income poverty, is severely materially deprived and has low work intensity (Tab. 4). In all monitored countries the share of households in extreme poverty out of the total population is quite low. The value of the Extreme Poverty Index ranges in an interval of 1.51 % to 2.01 %, but it must be reiterated that in the case of Germany this concerns 753 455 households, in Poland 243 662 households, in the Czechia 65 561 households and 37 292 households in Slovakia whose living conditions in multidimensional poverty are very bad.

The last three columns in Tab. 4 show the penetrations for households also at risk of income and materially deprived, at risk of income and with low work intensity and materially deprived and with low work intensity. Of these categories the most numerous are households at risk of income poverty and with low work intensity. People in households that do not use their work potential and are not economically active in the sphere of employment have lower income as opposed to the others. The following diagram (Fig. 1) shows how individual poverty dimensions in households penetrate each other.

Households living at risk of poverty are forced to manage with far lower income than the rest of the population. Almost all average income of households living at risk of poverty in whatever dimension are significantly lower than the poverty threshold (Tab. 5). The lowest average equivalised income of households in Poland is EUR 205 monthly, in Germany EUR 734 monthly. However, it cannot be said that German households living at risk of poverty do better thanks to higher income than Polish households, in the countries there is different income level. The average income in materially deprived households ranges around the poverty threshold, in the Czech Republic and Poland it is even slightly above it. The same could be said of households with low work intensity. The total lowest income in households at risk of extreme poverty is in Slovakia where the average equivalised income is EUR 135 per month.

**Fig. 1: Penetration of poverty dimensions in households in Germany, Czechia, Poland and Slovakia**



Source: own processing EU-SILC data

The absolute amount of income in different countries cannot be compared but the relative expression can be used (Tab.5). The share of average equivalised income in households at risk of extreme poverty against the average equivalised income in all household show that the situation is the worst in Slovakia (lowest share 21.88 %) and Poland. Slovak and Polish households have worse living conditions because they have to manage with lower income which is very low even in the context of the income level in the country concerned. On the other hand extremely low income households in Czechia are in better situation (37 % of the average income in the whole society).

**Tab. 5: Equivalised income (EI) of households at risk of poverty in euros per month**

	<b>Germany</b>	<b>Czechia</b>	<b>Poland</b>	<b>Slovakia</b>
<b>Average EI in households at risk of income poverty</b>	734	307	205	227
<b>Average EI in materially deprived households</b>	927	406	297	384
<b>Average EI in households with low work intensity</b>	1,007	401	300	223
<b>Average EI in households at risk of extreme poverty</b>	719	264	163	135
<b>Share of average EI in households at risk of extreme poverty against average EI of all households</b>	37.13 %	37.33 %	29.09 %	21.88 %
<b>Poverty threshold</b>	1 068	392	294	348

*Source: own processing EU-SILC data*

Households at risk of extreme poverty need to be accurately identified so social policy activities can be effectively targeted at them. Segments were created using a cluster analysis from the sets of individuals from households at risk of extreme poverty in Germany, the Czech Republic, Poland and Slovakia. The clusters are created based on demographic characteristics of consumers in households (economic activity, highest attained education, gender and age) and according to the type of household (i.e. the number of adults and children in the household). These 5 variables enter the cluster analysis and make segments in extremely poor households.

The algorithm of the two-step cluster analysis revealed the following segments of households living at risk of extreme poverty (Tab. 6).

**Tab. 6: Segments of households at risk of extreme poverty**

	Segment	Economic activity	Household type	Age group	Education	Gender
<b>Germany</b>	1.	Disability	Single-member	51-60	Secondary	Female
	2.	Unemployed	Single-member	51-60	Secondary	Male
	3.	Unemployed	One adult and children	41-50	Secondary	Female
	4.	Unemployed	Single-member	16-30	Lower secondary	Male
<b>Czechia</b>	1.	Unemployed	Single-member	51-60	Lower secondary	Male
	2.	Parental leave	2 adults and 1 child	16-30	Lower secondary	Female
<b>Poland</b>	1.	Unemployed	Single-member	51-60	Secondary	Male
	2.	Disability	Other	16-30	Primary	Female
<b>Slovakia</b>	1.	Unemployed	Adults with children	16-30	Lower secondary	Female
	2.	Unemployed	Adults with children	51-60	Lower secondary	Female

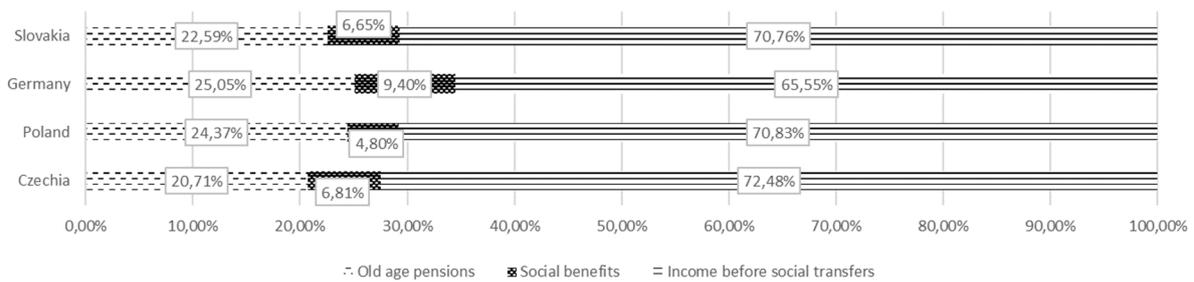
*Source: own processing EU-SILC data*

In all four monitored countries the group at risk is of pre-retirement age of 51-60. Another common factor for all countries is that single-member households in particular fall into extreme poverty. Besides these groups, in Germany other households at risk of extreme poverty are females living alone again of pre-retirement age of 51-60 who are unable to work usually due to long-term illness. Almost in all segments secondary education prevails, but often only at lower level and one with basic education. Therefore it can be assumed that the higher the level of education of people in a household the less likely they will fall into extreme poverty. In Slovakia and in all other countries the households most at risk are those with members of age categories 16-30 and 51-60, i.e. after completed education and before old-age retirement.

Social policy activities need to be targeted at above segments (Tab. 6) so that the fight against poverty is as effective as possible and there is the greatest possible progress in reducing the number of households at risk of poverty which is also one of the strategic objectives of the European Union. Governments help low-income households at risk of extreme poverty in the form of social transfers. In different member countries social transfers are differently effective depending on their structure and the share of old-age pensions and social benefits.

The diagram (Fig. 2) illustrates the share of social transfers in the income of all households in the country (not just those extremely at risk). The highest share of social transfers in total household incomes is in Germany which on average is 34.45 % of household incomes. The lowest share of social transfers in the incomes is in the Czech Republic (27.52 %), but does not mean the lowest efforts of the state to fight against poverty. In contrast, extreme poverty is the lowest in Czech households (Fig. 1). It shows that a higher share of social benefits at the expense of old-age pensions as part of social transfers is expedient as it leads to a lower rate of poverty in the country. In Poland, which has the lowest share of social benefits in household incomes (4.80 %), the poverty rate is higher than in CR or DE.

**Fig. 2 Social transfers in household income**



Source: own processing EU-SILC data

## 4 Discussion

The effort to reduce the number of households at risk of poverty is the common goal of EU countries. Regardless of the level of household income, in all the monitored countries there are households living in poverty that rely on state support in the form of social transfers. Inasmuch as poverty is multidimensional, as pointed out by Alkire et al. (2015), there is the need to also develop a multidimensional scale of poverty. Atkinson and Marlier (2010) measure the living standard and poverty only on the basis of household income. Income is a convenient objective scale, but does not reflect the actual household living conditions. On the other hand, the material deprivation indicator has a higher explanatory power about household living conditions. That is why in this study in the construction of the index to determine households at risk of extreme poverty, a combination of income and non-income perspective is used. This combination is supplemented by the unemployment indicator. Because as Vojtková and Šoltes (2018) or Alkire et al. (2015) claims, unemployment is seen as a significant determinant of poverty. The constructed Extreme Poverty Index contains three components – income poverty, material deprivation and low work intensity of a household. The combination of these poverty dimensions shows that 2.01 % of Slovak households live at risk of extreme poverty whereas the lowest rate of extreme poverty is in Czechia (1.51 %). Overall this is a low percentage, but it must be realised that when converted to population this is thousands of households such as 753 000 households in Germany or 244 000 Polish households.

These endangered households often have to rely on state help. So social policy activity needs to be targeted at the extremely low-income households. Halleröd and Larsson (2008) also come up with such an idea. That is why the cluster analysis was conducted here which identified segments of households living at risk of extreme poverty. A segment made up of consumers of pre-retirement age who live alone is revealed in all countries. If they lose their job, it is very difficult for them to find a new one at this age. Single-member extremely at risk households are no exception even in one monitored country. Another discovered at risk group which must certainly be monitored is females with children. The structure of social transfers contributes to the efficiency of social transfers in the process of reducing poverty in the EU. It is shown that a higher share of social benefits in household income leads to a lower rate of poverty in the country concerned.

A shortcoming of the constructed index could be the question of the topicality of the material deprivation indicator. This indicator is defined according to EU methodology

which has not recently been updated and the construction of the material deprivation indicator contains items such as a telephone (landline) or television. It does not consider the current trends when a landline in the household is obsolete technology and instead of a TV, households have other more advanced preferences.

## Conclusion

Households living at risk of extreme poverty are also found in the countries of the European Union. This is seen for example in the analysed four countries, i.e. Germany, Poland, the Czech Republic and Slovakia. The Extreme Poverty Index was constructed for households in these member countries which combines three poverty dimensions – income poverty, severe material deprivation and low work intensity. The index's income component is the starting point for determining low-income households. But income poverty is not enough for a more detailed analysis of the living conditions of low-income households. That is why the index includes unemployment in a household which is displayed in the household work intensity component and household material deprivation indicator in a severe form of deprivation.

After the construction of the Extreme Poverty Index, it was revealed that in Slovakia 2.01 % of households live at risk of extreme poverty, in Germany and Poland the situation is similar, slightly lower risk and in the Czech Republic the risk of extreme poverty is the lowest – 1.51 %. These are low values however after conversion to absolute numbers this involves hundreds of thousands of households with highly inadequate living conditions.

Households living at risk of extreme poverty detected on the basis of the Extreme Poverty Index should be the target group of social transfers so the social policy activity of the country concerned are as effective as possible and so social transfers can go to the household where required. The identification of households at risk of extreme poverty was made possible by the conducted cluster analysis which in the set of at risk households discovered the most numerous clusters and types of these households.

## Acknowledgement

This contribution was supported by “Research Infrastructure for Young Scientists”, No. CZ.02.1.01/0.0/0.0/16\_017/0002334.

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## Contact Address

### Ing. Irena Antořová

Mendel University in Brno, Faculty of Business and Economics, Department of Marketing and Trade

Zemědělská 1, 613 00, Brno, Czech Republic

Email: [irena.antosova@mendelu.cz](mailto:irena.antosova@mendelu.cz)

Phone number: +420545132331

Received: 07. 08. 2019, reviewed: 29. 11. 2019

Approved for publication: 09. 12. 2019