Foreign income of households and its determinants

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Abstract

The purpose of this article is to determine and present the scale of foreign sources of income of Polish households and their significance for the budget and the financial situation of these households.

To achieve this purpose, individual data from the Household Budget Survey of 2015 will be used. In that edition of the survey, in addition to information about revenues from various sources (including 12 categories of foreign income), there were collected data concerning the direct assessment of the impact of foreign income on the financial situation of households.

To carry out a statistical analysis, theoretical models of income distribution have been used, including Burr distributions. They will allow to describe the distribution of income from abroad and the total income of households having income from abroad compared to households without such income. A censored data model has also been applied to identify determinants of income from foreign sources.

Keywords: household, income, financial situation
JEL Classification: C51, D31

1   Introduction

Over the last centuries, as well as the last decades, the history of Poland has been full of events that created favourable conditions for emigration or forced Polish people to emigrate to other countries. The loss of Poland's independence in the eighteenth century and unsuccessful attempts to regain the same in the nineteenth century led to mass emigration of Poles caused by political factors. The migration of Polish people for economic reasons began on a large scale in the late nineteenth century and the early twentieth century, when during the period from 1870 to 1914, approx. 4 million Poles emigrated to the USA (Biedka, 1995). The regaining of independence after the First World War did not put an end to emigration from Poland. As estimated by H. Janowska, approx. 2.1 million people left Poland during the interwar period (Janowska, 1981). The post-war period was characterized by a relatively low level of emigration. This phenomenon intensified in the 1980s. According to M. Okólski, the total number of those who left in that period amounted to approx. 2.2 million people (Okólski, 1994). The 1990s was a period of a decline in long-term migration in favour of short-term movements, mostly of economic nature. It is estimated that during that period (1990-1999), 216,000 people left Poland permanently (Bobrowska, 2013). After Poland acceded the

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European Union, there was an increase in migration of Poles, mainly to EU countries. The migration of the population has become relatively easy, and the main objective of migrants was, and still is, to obtain better working conditions, improvement of material conditions and career development. Results of the last census carried out in Poland in 2011 showed that at the time of the census, more than 2,014 thousand permanent residents of Poland stayed abroad (for more than 3 months). The census also showed that 1,307 thousand households (9.6%) in the country included at least one person staying abroad for over 3 months. Among them, 52.2% were households in which not all of their members were abroad (GUS, 2015). Such a large scale of emigration, including that of economic nature, involves obtaining foreign income for the benefit of households in Poland. This income is transferred to Poland, and it often constitutes the basic source of income for families.

The purpose of this article is to determine and present the scale of foreign sources of income of Polish households and their significance for the budget and the financial situation of these households.
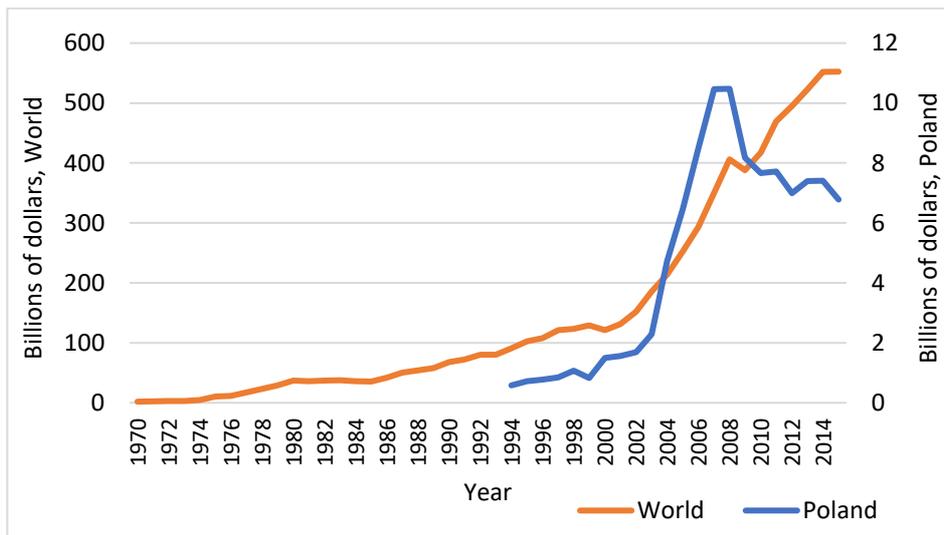
2   Remittances

Remittances are defined as household income received from abroad mainly as a result of gainful employment of those members of the household who stay temporarily or permanently in a country other than the country where the household resides (IMF, 2009). Remittances can be transferred in cash, via cash transfers, in kind or in other formal and informal ways.

For the purpose of an analysis of cash flows between a country from which funds are transferred and a country to which they flow, the term "personal remittances" is used that consists of: personal transfers and compensation of employees. Personal transfers include all current transfers in cash or in kind between resident and nonresident individuals, independent of the source of income of the sender (irrespective of whether the sender receives income from labor, entrepreneurial or property income, social benefits, and any other types of transfers; or disposes assets) and the relationship between the households (irrespective of whether they are related or unrelated individuals). Compensation of employees (wages and salaries in cash, wages and salaries in kind, and employers' social contributions) refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities. (IFM, 2009).

Papers addressing the remittance problem often consider it in the context of reasons that have led people to earning foreign income for the benefit of their households. As noted by Amuedo-Dorantes and Pozo (2011), in many developing countries, the changeability and

volatility of income is a key reason for seeking such sources of revenues that will enable people to stabilize the economic situation of their households and raise the standard of living, in particular in the case of households experiencing poverty. Dean Yang and HwaJung Choi (2007) also showed that remittances are a response to one-time shocks (declines in income) that can help to stabilize the level of household income over time. However, there are more reasons for obtaining income from abroad. Remarks on migrants' motivation for transferring remittances can be found, for example, in (Amuedo-Dorantes and Pozo, 2011), (Bauer and Sinning, 2009) or (Ilahi and Jafarey, 1999). The problem of motivation for earning foreign income and the impact of such income on the situation of households and economic growth is widely discussed by Yang (2011).

Income generated abroad is of increasing importance. As Figure 1 shows, the level of personal remittances has grown dynamically, especially since 2000.

Fig. 1. Remittances received in billions of current US dollars for Poland and World.
Source: IMF.

In Europe, this has been a period of expansion of the European Union, and globally - of increased migration mobility resulting from enhanced communications possibilities, liberalization of administrative restrictions and, unfortunately, numerous conflicts in various parts of the world. In Poland, we could observe a noticeable increase in the level of remittances in the period after the accession to the European Union. The global economic crisis at the end of the first decade of the twenty-first century reduced the level of income sent to Poland from abroad. Over the last few years, a decreasing trend as regards the level of such income can be observed, which may result from the fact that a large part of migrants have put

down roots in the country of their migration destination. A decision on the permanent stay abroad often involves the necessity for a family to join the person who has emigrated first, which naturally eliminates income remittances from abroad to Poland. Globally, the highest level of received remittances was recorded in 2015 in the case of India and China. These were amounts equal to 72.2 and 63.9 billion US dollars, respectively. Among countries sending remittances, the highest level of income flowed from the US and Saudi Arabia. In the case of Tajikistan, nearly 42% of GDP came from remittances, whereas Luxembourg was distinguished by the highest outflow of income in relation to GDP (19.6%). More than 25 billion US dollars were transferred only from the US to Mexico and another 16.3 billion from the US to China (World Bank Group, 2016).

3 Income from abroad on the basis of the Household Budget Survey in Poland

The empirical part of this paper has been developed using data from the HBS conducted in Poland in 2015. In total, 37,148 households were surveyed to acquire information on income, expenditure and characteristics of the households and their members. Under the study of sources of income earned by individual members of households, 12 categories of income received from abroad were distinguished, of which income from employment and income from self-employment are most important in terms of value and quantity. Comprehensively, income from working abroad in 1,023 surveyed households constitutes over 88% of all foreign income. The above 88% was achieved by 78% households. Among all the households, only 2.8% of them throughout Poland declared obtaining income from abroad. The largest share of such households was recorded in the Opolskie Voivodeship (8.0%), the Lubuskie Voivodeship (6.1%) and the Podkarpackie Voivodeship (5.9%), whereas the smallest - in the Mazowieckie Voivodeship (1.2%) and the Wielkopolskie Voivodeship (1.3%). Considering the category of the locality of residence, it can be noticed that along with an increase in the size of the locality, the share of households with income from foreign sources declines. The largest share of households with income from abroad, broken down by biological type, is on the part of households of other persons with dependent children (7.0%), households of married couples with at least one dependent child and other persons (5.8%) and married couples with three dependent children. The above-mentioned households of other persons with dependent children refer - as it can be assumed - to a situation where both parents work abroad and children in Poland are cared for by other persons (e.g. grandparents or other relatives). The share of households with income from abroad is also associated with evaluation of the financial situation and the manner of spending money. The higher the assessment of this situation, the more

common are households with income from abroad. The largest share of households with income from abroad relates to a situation where a household declares that it can afford some luxuries.

As part of the HBS in 2015, for the first time there were collected data on the extent of income from abroad and its impact on the economic situation of households. In the first case, respondents were asked what part of household income is formed by income from work abroad, and in the second case - how income from work abroad influences the ability to purchase durable goods and real property. In general, slightly more than 29% of households with income from abroad stated that such income constituted their entire income, and nearly 47% - that it formed more than half of their income. The largest share of households declaring that their entire income came from work abroad (almost 43%) was observed in the Pomorskie Voivodeship, while the smallest (just over 20%) - in the Lubelskie Voivodeship. It is worth noting that along with an increase in the number of dependent children, income from work abroad becomes increasingly important for the household budget. It can also be noted that along with an improvement in the financial situation and positive evaluation of the manner of spending money, there is an increase in the share of households with budgets more dependent on income from work abroad. Very similar conclusions can be drawn from an analysis of distribution of answers to a question about the influence of income from work abroad on the ability to purchase durable goods and real property.

In the next part, results of an analysis of income distribution will be presented briefly. Such a distribution can be examined empirically or with the use of theoretical functions. The application of the second approach is beneficial in terms of relatively easy calculation of characteristics of the distribution; however, it requires the selection of an appropriate density function and fitting it to empirical data. The following part shows values of the said characteristics of distribution using the Burr Type III (Dagum) theoretical distribution, whose parameters were estimated using ML[2]. In each case, the estimated parameters were found to be statistically significant. Table 1 presents results of calculations of basic characteristics of income distribution of all households altogether, income distribution of households having income from abroad and those that do not have such income. Analogical calculations were carried out for per capita income and equivalent income, using the OECD scale. Furthermore, the distribution of income from abroad was analysed in these three categories.

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[2] The subject of theoretical distributions and their application in an analysis of income is widely discussed in (Kleiber nad Kotz, 2003). On the other hand, McDonalda and Xu (1995) indicates that the Burr III distribution is one of the best distributions to approximate empirical distributions of income.

Descriptive statistics	Total income of household	Total income of household with remittances	Total income of household without remittances
Mean	3,973.46	5,279.88	3,933.12
Median	3,312.58	4,716.36	3,277.05
Mode	2,635.41	4,124.68	2,605.59
Coefficient of Variation	0.81	0.61	0.807
Relative mean deviation	0.244	0.206	0.244
Gini Coefficient	0.347	0.294	0.348
Skewness	0.418	0.361	0.418
Sen Index	2,592.82	3,726.53	2,566.27

Table 1. Descriptive statistics for the distribution of household total income.

An average level of household income is significantly higher in the case of households with income from abroad, and the level of inequality is lower compared to households without such income. This results in a significantly higher value of the Sen index, which, in a simplified manner, measures the level of social welfare resulting from income distribution[3]. When the distribution of per capita income is considered, the difference in the average level of income is not so significant any more, though the level of inequality is still lower in the case of income of households with income from abroad. The reduction in the difference between average values of per capita income results from the fact that households with income from abroad are characterized by a larger number of people, often dependent children. A diversified average level of equivalent income confirms this conclusion. The equivalence scale transforms the number of people in a household into a number of equivalent units the number of which is lower than the number of people in the household. It results in an increase in the equivalent income in terms of per capita income, especially in multi-person households with dependent children. In addition to the above categories of income, the distribution of income from abroad was also analysed. Its average level per household amounted to PLN 3,375, per persons - PLN 921 and per equivalent unit - PLN 1,235. The level of

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[3] The Sen index (as the result of the following formula S = average income*[1-Gini coefficient]) allows to compare the level of social welfare, the higher the level of Sen index, the higher the level of social welfare.

inequality was relatively high in this case. The value of the Gini coefficient ranged from 0.367 to 0.387, which shows that income of Polish households generated abroad is relatively highly diversified.

In order to determine factors affecting the amount of income from abroad, the Heckman sample selection model was applied. In this model, it is assumed that the criterion on the basis of which observations are included in a sample depends on an additional regression equation (selection equation). If it does not depend on that, the proper method for estimating the regression equation (output equation) is OLS[4]. As an explanatory variable, a natural logarithm of household foreign income ($\log y_1$) was adopted, whereas the following were considered as explanatory variables: 5 dummy variables identifying individual categories of localities where households reside (the reference category is the largest city), 3 dummy variables identifying the level of education of the household head (the reference category is lower secondary education), 3 variables defining the number of people in the household (a number of children up to the age of 14, a number of dependent children between 14 and 25 years of age, a number of adults), one dummy variable identifying whether the household head is disabled and one variable which is a logarithm of age of the household head. In the selection equation, the following variables were included: the category of localities where households reside (6 categories), the level of education of the household head (4 categories), an assessment of the financial situation of the household (5 categories) and the age of the household head. Results of the Heckman regression estimation with the use of ML are summarized in Table 2.

The parameter (rho) indicates that error terms of the selection equation and the output equation are strongly correlated, which justifies the use of a model with sample selection. All estimates of regression parameters were found to be statistically significant. Along with a decrease in the size of localities where households reside, an average level of income from foreign sources decreases (e.g. in the villages these revenues are lower by 40,9%[5] than in the largest cities), while it increases along with an increase in the level of education of the household head (in the case of higher education by 114% than for primary educated household head). An increase in the number of children under the age of 14 and between 14 and 25 years of age, as well as an increase in the number of adults in the household weighed in favour of an increase in the average foreign income in a household, which is consistent with the results presented above.

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[4] More on the Heckman sample selection model can be found for example in (Green, 1993).
[5] $\exp(-0.5251) - 1 = -0.409$.

Regressors	Coefficient	Standard error	Z	p-value	
Output equation: $\log y_1 = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \ldots + \alpha_k x_k + \varepsilon$					
Constant	8.7022	0.4404	19.75	<0.0001	***
Town 200-500 thous. inhabitants	−0.3025	0.1487	−2.03	0.0420	**
Town 100-200 thous. inhabitants	−0.4222	0.1534	−2.75	0.0059	***
Town 20-100 thous. inhabitants	−0.3669	0.1434	−2.56	0.0105	**
Town less than 20 thous. inhabitants	−0.4953	0.1461	−3.39	0.0007	***
Village	−0.5251	0.1450	−3.62	0.0003	***
Vocational education	0.3799	0.0656	5.80	<0.0001	***
Secondary education	0.5161	0.0816	6.33	<0.0001	***
Higher education	0.7611	0.1164	6.54	<0.0001	***
Number of children age up to 14 years	0.0640	0.0221	2.89	0.0038	***
Number of children aged 14 to 25 years	0.0559	0.0314	1.77	0.0760	*
Number of adults	0.0630	0.0250	2.52	0.0116	**
Disabled person	−0.2229	0.1090	−2.05	0.0408	**
Log of age	0.6379	0.1240	5.14	<0.0001	***
lambda	−1.5911	0.0805	−19.76	<0.0001	***
Sample selection equation: $y_2 = \beta_0 + \beta_1 z_1 + \beta_2 z_2 + \ldots + \beta_s z_s + \zeta$					
constant	−0.4774	0.1001	−4.77	<0.0001	***
Class town of residence	0.0521	0.0085	6.12	<0.0001	***
Education level	−0.1713	0.0165	−10.39	<0.0001	***
Financial situation	−0.2034	0.0142	−14.38	<0.0001	***
Age	−0.0139	0.0010	−14.44	<0.0001	***

rho1 = -0.96; Akaike'a criterion = 11055.23; Sigma (Se) = 1.65.

Table 2. The ML estimation results of the Heckit model.

In households in which their head is a disabled person, the level of income from abroad was lower on average by 20% than in other households, while an increase in the age of the household head by 1% involved an increase in the average level of the surveyed income by 0.64%, *ceteris paribus*. Moreover, results of the estimation of parameters of selection equation showed that the existence of income from abroad in household depends on class town of residence, educational level of household head and financial situation in the household.

Conclusions

The problem of income from abroad is an important research issue in both the macroeconomic scale of financial flows among countries and in the microeconomic scale of its impact on the economic and financial situation of the population (households). The presented research results indicate high significance of this income for the total level of income of households in Poland and, as a consequence, the financial situation of these households. This is supported by a lower level of poverty risk in the case of households with income from abroad than in the case of households without such income (33.7% of households with income from abroad and 37.8% of those without such income did not reach the subsistence level).

To sum up, the highest share of households receiving income from abroad can be observed in the case of the Opolskie Voivodeship (inhabited by a population having contacts with Germany in great measure), in the case of households living in rather small towns, households where parents do not attend directly to their children and households assessing positively their financial situation. The level of income of households with income from abroad is significantly higher than that of households without such income, though in the case of per capita income, the difference ceases to exist. However, when diversification of the household composition is considered (by using the equivalence scale), income from abroad leads to higher average income in total. The application of regression modelling basically confirmed the previously observed regularities.

Acknowledgements

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