THE RELATIONSHIP BETWEEN THE AVERAGE MONTHLY NET WAGE AND PERMANENT EMIGRANTS IN ROMANIA

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Abstract. The paper aims to present the relationship between the average monthly net wage and permanent emigrants at the level of our country for a period of 12 years. At the level of Romania, in the last 30 years, the trend of emigration has been observed, especially for obtaining higher incomes than those that could be earned in the country. In (the year) 2021, the top three countries chosen by permanent emigrants were Spain, Germany and Italy. They keep their place in the top three countries chosen for emigration in the last five years of the analyzed period. We consider that the presentation of the two indicators will allow us to observe the relationship between them, using one of the non-parametric methods for establishing the link between statistical variables, namely the Kendall coefficient. The analysis of the two indicators is carried out with the help of the rank method, a statistical method, which involves establishing the ranks (position) for the values of the two indicators for the entire analyzed period. The values recorded by the average monthly net salary and permanent emigrants are official data, provided by the National Institute of Statistics. The result obtained after calculating the Kendall coefficient demonstrates that there is a link between these indicators, it is direct and of medium intensity. These information allows us to conclude that the level of salary earnings in Romania is one of the decisive factors in making the decision to emigrate.
Keywords: wage earnings, permanent emigrants, Kendall coefficient, Romanian economy, direction, intensity
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Introduction. The paper aims to analyze the relationship between the average monthly net wage and permanent emigrants at the level of our country for a period of 12 years. The National Institute of Statistics is the official source for obtaining the values recorded by the two indicators.

The net wage gain is calculated by subtracting from the gross wage gain the mandatory social contributions of employees and the corresponding tax. Permanent emigrants or emigrants with a change of residence are persons of Romanian citizenship who emigrate abroad, giving up their residence in Romania and establishing their residence on the territory of another state.

By presenting the two indicators, we will be able to observe the existence of a relationship between the average monthly net wage and permanent emigrants. The existence of this relationship will later allow us to establish the meaning of the link as well as its intensity.

The data analyzed for the two indicators are from the period 2010-2021.

The degree of approach of the theme in the scientific literature. Over time, there have been movements of the population from one area to another, migration being a phenomenon reflected in specialized literature in numerous books and articles. Bălănescu (2011) states that population migration is not random, but is influenced by social, political, economic transformations, from different regions of the country, from the country or from other countries.

Dobrotă and Aceleanu (2007) believe that the main cause of migration is the existence of economic gaps between underdeveloped and economically developed countries. Thus, these gaps lead people to look for new, better-paid jobs, wanting to earn more compared to what they could earn in Romania

Șcheau et. al (2020) believe that economical migration is first of all generated by social background: poverty, unemployment, low quality of life, badly paid work places and so on.

Migration has become a social phenomenon over the years state Mîndrican and Matei (2023). These authors consider that the main reasons that influence individuals in making this decision are age, marital status, level of qualification from a professional point of view, background, professional perspectives, etc.

Our country is also no stranger to the migration phenomenon, in the last 30 years emigration has influenced the labor market in Romania. The choices made by those who permanently emigrated in 2021 were Spain, Germany, Italy, Austria, the USA and Canada. These are only the first six states chosen by migrants.

The National Institute of Statistics (2023) provides us with the official data on the number of emigrants by country of destination.

Table 1 shows the first six countries chosen by migrants, and we can see that Romanians do not only choose countries from Europe, preferring other continents as well. In the top three selected countries are European countries: Spain, Germany and Italy.

They keep their place in the top three countries chosen for emigration in the last five years of the analyzed period.

Table 1. **Permanent migrants by country of destination**

Country	2017	2018	2019	2020	2021
Austria	1531	1746	2004	1623	2581
Canada	1048	1126	1163	379	1242
Germania	4088	3961	3671	4257	5121
Italia	3449	4553	4966	3094	4986
Spania	5517	6910	5891	4272	5970
SUA	1165	1243	1227	777	1695

Source: Made by the authors using official data provided by the National Institute of Statistics, Permanent migrants by country of destination, http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table

Research methodology. In the present work, a statistical method will be used to demonstrate the relationship between the average monthly net wage and permanent emigrants, because statistics provides a wide range of methods for analyzing the dependence between two or more variables.

In this paper we will use a non-parametric method of statistical link analysis, namely the Kendall coefficient. This coefficient provides us with a series of essential information for the analysis of the relationship between the two indicators. It can be used to demonstrate the existence of a link between variables, its direction and intensity.

The intensity of the link between the variables using the Kendall coefficient is determined by observing the obtained result.

Thus, the closer the obtained result is to the value 0, the weaker the intensity of the link and the closer it is to the value 1, the stronger the link (Grigorescu, 2010). All the obtained result gives us information about the direction of the link:

• positive means a direct connection,

• negative means a reverse connection.

To calculate the Kendall coefficient, it is necessary to determine the type of the two variables.

We believe that the level of wage is a factor that influences the decision to emigrate, but at the same time we do not believe that it is the only one. With this reasoning in mind, the two variables were considered as follows:

• the average monthly net wage being the independent variable (will be denoted by X);

• permanent emigrants being the dependent variable (they will be denoted by Y);

Using the Kendall coefficient we can demonstrate the existing relationship between the average monthly net wage and permanent emigrants at the level of the Romanian economy, over a period of 12 years (2010 - 2021).

The hypotheses we start from are the following:

• There is a link between the average monthly net earnings and permanent emigrants

• The link between the average monthly net earnings and permanent emigrants is a direct link.

The present work allows us to establish through a statistical method whether the hypotheses we started from are true or not.

From *Figure 1* we observe the evolution of permanent emigrants for the period 2010 - 2021.

From the presentation of the official data provided by the National Institute of Statistics, the values recorded by permanent emigrants have an increasing trend.
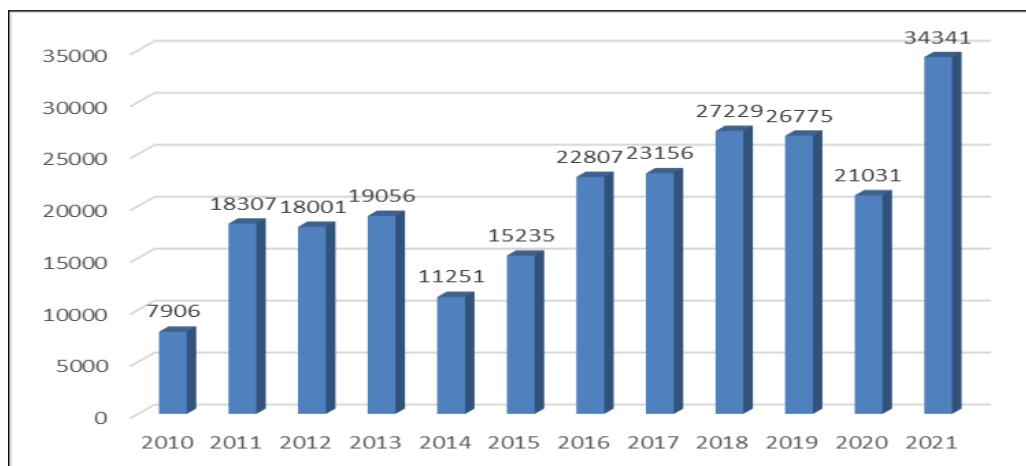
***Figure 1.* Permanent emigrants by country of destination (pers.)**
Source: Made by the authors using official data provided by the National Institute of Statistics, Permanent emigrants by country of destination, http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table

In 2010, there were 7.906 permanent emigrants, and in 2021 we have 34.341 permanent emigrants. For the analyzed interval, we observe the existence of value oscillations, so we register lower values compared to the previous year in:
- 2012 we have 18.001 permanent emigrants compared to 18.307 permanent emigrants;
- 2014 we have 11.251 permanent emigrants compared to 19.056 permanent emigrants;
- 2019 we have 26.775 permanent emigrants compared to 27.229 permanent emigrants;
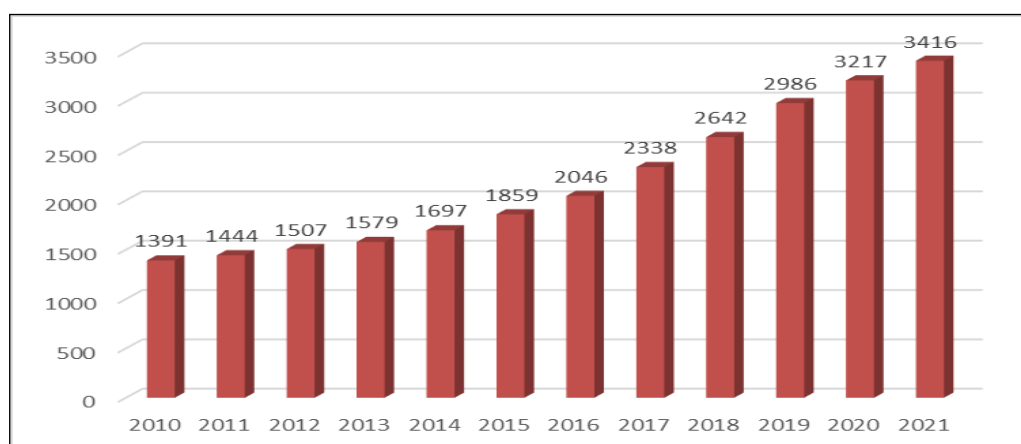 - 2020 we have 21.031 permanent emigrants compared to 26.775 permanent emigrants

***Figure 2.* Average net monthly wage (RON)**
Source: Made by the authors using data provided by the National Institute of Statistics, Average monthly net wage earnings, http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table

From *Figure 2*, we can observe the evolution of the average monthly net wage in Romania. The recorded values are official provided by the National Institute of Statistics.

From the presentation of the data for the period 2010 – 2021, the average monthly net wage showed an increasing trend, without oscillations in the analyzed period. At the level of 2010, the average monthly net salary was 1391 RON, and in 2021 we have a value of 3416 RON.

Main results. Kendall's coefficient and Spearman's coefficient belong to the method of ranks, one of the non-parametric methods of statistical link analysis. In order to obtain the result specific to the Kendall coefficient, it is necessary to establish the specific ranks of the two indicators.

The Kendall coefficient is calculated according to the formula:

$$C_K = \frac{2\sum(P-Q)}{n(n-1)} \quad (1)$$

where: P - number of ranks higher than the researched rank;
Q - number of ranks below the researched rank;
n- number of pairs

Table 2. **The specific ranks of the Kendall coefficient**

Year	Permanent emigrants	The average net monthly wage	Rx	Ry	P	Q	P-Q
2010	7906	1391	1	1	11	0	11
2011	18307	1444	2	5	7	3	4
2012	18001	1507	3	4	7	2	5
2013	19056	1579	4	6	6	2	4
2014	11251	1697	5	2	7	0	7
2015	15235	1859	6	3	6	0	6
2016	22807	2046	7	8	4	1	3
2017	23156	2338	8	9	3	1	2
2018	27229	2642	9	11	1	2	-1
2019	26775	2986	10	10	1	1	0
2020	21031	3217	11	7	1	0	1
2021	34341	3416	12	12	0	0	0
Total							**42**

Source: Made by the authors

The values in *(Table 2)* allow us to calculate the value of the Kendall coefficient, using the previously presented formula (1). To determine the specific values of P and Q we determined the ranks for the two indicators (Rx and Ry).

$$C_K = \frac{2*42}{12(12-1)} = 0{,}636 \quad (2)$$

The Kendall coefficient has a value of 0.636. This result indicates that there is a link between the two indicators, it is direct and of medium intensity.

Conclusions. Using one of the non-parametric methods for establishing the link between variables, we managed to analyze the relationship between the average net monthly wage and permanent emigrants and to demonstrate that the research hypotheses proved to be correct. There is a link between the two indicators. The obtained results showed both the direction of the link and its intensity. We can state that there is a direct link between the average net monthly wage and permanent emigrants, but of medium intensity. This result demonstrates that the decision to emigrate is influenced by the level of the net monthly wage in Romania, but it is not a decisive factor. The results obtained in this paper open new research directions, especially in presenting the other influencing factors in making the decision to emigrate.

The present paper only analyzed the existence of the relationship between the average net monthly wage and permanent migrants, which allows us to conclude that there is a great potential to be studied in future works regarding the migration phenomenon. In the following articles, we intend to analyze permanent migrants according to several criteria: age, sex, marital status and level of training.

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