Agricultural & Rural Studies

Article

Emigration and Common Agricultural Policy in Romanian Rural Areas: An Analysis of Patterns of Inefficiency

Nicola Galluzzo

Association of Economic and Geographical Studies in Rural Areas, Rieti 02100, Italy; asgear@libero.it

Abstract: Romanian rural areas have suffered a significant permanent emigration since the early 1990s and the European Union by the Common Agricultural Policy has tried to slow down this negative phenomenon. The main research question was to assess if the Common Agricultural Policy has been a leverage of socio-economic development in Romanian rural areas reducing the permanent emigration from the countryside since 2010 to 2020. The quantitative approach has used the Data Envelopment Analysis and the Multi-directional Efficiency Analysis in order to assess the patterns of inefficiency due to an excess of some variables impacting to the permanent rural emigration.

Keywords: MEA; DEA; excess of input-output; second pillar; CAP; efficiency

Citation: Galluzzo, N. Emigration and Common Agricultural Policy in Romanian Rural Areas: An Analysis of Patterns of Inefficiency. *Agricultural & Rural Studies*, *2023*, *1*, *0003*. *https://doi.org/10.59978/ar01010003*

Received: 20 April 2023
Revised: 10 May 2023
Accepted: 26 May 2023
Published: 3 June 2023

Publisher's Note: Trenton Gary, SCC Press stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

1. Introduction

Romania's agriculture went through major structural, social and institutional changes since the early 1990s with intense migration from urban to rural areas consequence of a restitution of agricultural land capital and the loss of jobs in urban areas (Gavrilescu et al., 2020). According to these authors there has been a lack of available labor in small and medium-sized farms that are predominant in Romanian primary sector. Furthermore, since the collapse of the Berlin Wall Romania has suffered an intense permanent emigration to other European countries and other countries outside the Europe such as USA and Canada (Sandu, 2005). Romania in the European Union countries is characterized by one of the highest values in out-migration hierarchy (Mitrică et al., 2022). These authors have argued as a high magnitude of out-emigration is correlated to a low level of the social-economic and technological endowment which is typical and distinguishing in several counties of Southern Romania.

In many European Union countries, the emigration is the most important factor in population change but in Romania this phenomenon is something new that has made an appearance in the nineties of the past century. Nevertheless, a recent study carried out in 42 Romanian counties has underlined as the out-migration persists with a dichotomy between regions such as Southern ones and Western and Central regions due to a different social and technological degree (Mitrică et al., 2022).

Mitrică et al. (2019) in previous research have investigated the Romanian out emigration and the effect of the emigration to the social development underling as in the recent year 4.4 million people have left Romania to other European Union (EU) member states while on the contrary at least 3.1 million emigrants left an EU member state. The EUROSTAT reported as Germany has had 917.000 immigrants, United Kingdom 644.200 and Italy 343,400 (EUROSTAT, 2019).

Recent research has pointed out as the out-emigration in Romania can been investigated in 5 different stages since 1990 to 2007 year of the enlargement of the EU to Romania and Bulgaria (Mitrică et al., 2019; Roman & Voicu, 2010; Tomescu-Dumitrescu, 2017). After the fall of the Berlin Wall, more than 90.000 people left Romania (Tomescu-Dumitrescu, 2017). Since the EU enlargement the free access to all EU countries lots of people left Romania to Italy and Spain in order to improve their living conditions by a free access to the European labor market(Anghel, 2016; Anghel et al., 2017; Mitrică et al., 2019; Botezat et al., 2016; Ianoş, 2016; Ianoş et al., 2016).

Sandu in 2005 has argued as in order to investigate the permanent emigration it is fundamental to use a multidimensional approach both in the micro and also in the macro domain to take into account different variables involved in the emigration. As proposed by Sandu (2005) the permanent emigration could be a life strategy for Romanian population aimed at facing with some major challenges of the post-communist Romanian environment where human and social capital have been two important driving factors impacting the emigration in particular in rural areas. It is important to underline as Romanian rural areas have suffered mostly the phenomenon of permanent

emigration than the urban territories. In the last two decades, the migration into the EU countries has become an important issue because it is a factor influencing population changes in Europe. Since 2007 a free access to the European labor market has stimulated the permanent emigration in Romania which is related to social development (Iordache & Titan, 2022; Mitrică et al., 2019). Both the permanent emigration and also the temporary emigration are very important drivers acting in a loss of human capital and in labor-migration flows.

According to Mitrică et al. (2019), almost 10% of the EU's highly-skilled population are living abroad and in two poorest Romanian regions such as South-West and South-Muntenia the migrants tend to be low-skilled. It is interesting to underline as the permanent emigration is typical of qualified people, for example, more than 26% of Romanian physicians work and live abroad and most permanent emigrants come from urban areas, while from rural areas emigrated people with a low level of social development and low-qualification and these people are employed in agriculture, sanification and construction (Mitrică et al., 2019).

The main driving factors that have pushed Romanian people to emigrate are characterized by a socio-economic nature (Mitrică et al., 2019). In general, more favorable economic conditions in terms of wages, better opportunities for employment and wealth creation have been very attractive aspects in the emigration process compared to unfavorable conditions at the place of origin such as poverty, poor infrastructures, lack of job opportunities (Mitrică et al., 2019; World Economic Forum, 2017).

The EU policy has tried by the Common Agricultural Policy (CAP) to slow down this negative phenomenon of emigration in the countryside stimulating by specific funds and initiatives the local economic development (Galluzzo, 2016). The impact of Common Agricultural Policy subsidies diverges in function of the type of financial subsides allocated such as first or second pillar subsidies and financial aids of the CAP. In fact, recent research's findings in literature review have highlighted out a positive correlation between rural emigration and financial payments allocated by the first pillar of the CAP. On the contrary, the impact of financial supports allocated by the second pillar of the CAP to the rural development did not imply any effects in reducing emigration from Romanian countryside. In general, less favored rural areas, characterized by a low level of assets and investments have had the highest level of permanent emigration hence, drawing some conclusions, the Rural Development Plan that every EU country has proposed and stimulated should implement the financial allocation towards rural areas which recently are involved in an intense process of counter-urbanization from urban space (Galluzzo, 2016, 2021a, 2021b, 2021c). In other new member states of the EU such as Slovenia and Hungary CAP subsidies disbursed in the framework of the first pillar have had positive effects on farm employment (Bojnec & Fertő, 2022) and consequently to the permanent emigration from rural areas where Pillar II and investment subsidies have pointed out mixed effects (Garrone et al., 2019; Minviel & Latruffe, 2017). The creation of new job opportunities and maintenance of working chances in rural areas has been a traditional Common Agricultural Policy target (Bojnec & Fertő, 2022; Kuiper et al., 2020).

Some quantitative studies carried out in Romania aimed at investigating links between financial subsides allocated by the Common Agricultural Policy and permanent emigration in this country have highlighted out a positive correlation between rural emigration and financial payments allocated by the first pillar of the CAP and no effects have been assessed in financial supports allocated by the second pillar of the CAP to the reduction of permanent emigration in Romania (Galluzzo, 2021b, 2021c). Furthermore, this latter author has argued as less favored rural areas, characterized by a low level of assets and investments, have had the highest level of permanent emigration in Romanian counties.

2. Aim of the Research

As mentioned before in the introduction, the permanent emigration is driven by a combination of economic, environmental, political and social factors (Mitrică et al., 2022; Mitrică et al., 2019). The main purpose of this research was to assess by a quantitative approach if the Common Agricultural Policy by the different allocation of financial subsidies has been a leverage of socio-economic development in Romanian rural areas reducing the permanent emigration from the countryside. In fact, in literature there is a lack of studies addressed in estimating the relationship between CAP subsidies and permanent emigration in Romanian rural areas (Galluzzo, 2021b).

A literature review has investigated as other driver factors classified as push and pull factors and relative economic prosperity and political stability of the European Union have had a significant pull effect on the demographic flows in some EU countries as reported by EUROSTAT in 2019 (Mitrică et al., 2022).

The main purpose of this research seeks to break the pattern of the classic investigation of the relationship between permanent emigration, public policies such as the CAP and socio-economic development addressing the attention to the role of exogenous variables such as risk of poverty, subsidies allocated by the CAP to the rural development and living population in rural areas in 8

Romanian regions (NUTS2) since 2010 to 2020. The analysis has investigated which socio-economic variables have impacted to the permanent emigration which has been estimated as an output in a model of assessment of the efficiency, that has to be minimized in an approach input-oriented, assessing consequently in a second stage of this study the patterns of inefficiency in each variable investigated in the model namely which variables can increase or reduce the efficiency in terms of emigration defining some measures of policy to contrast to permanent emigration in rural areas.

3. Methodology

In this study using the data published by the Farm Accountancy Data Network (FADN) and by the Romanian National Institute of Statistics it has been estimated since 2010 to 2020 in rural areas which variables have acted to the emigration. The quantitative approach has used a new estimation approach of the permanent emigration and the relationships to all investigated variable (Table 1) by an assessment of the variable permanent emigration in terms of the technical efficiency with the aim of minimizing this latter variable or rather Romanian permanent emigration from rural areas (output variable), acting on the socio-economic variables of input.

In general, there are two different methodologies aimed at assessing the technical efficiency; one through a parametric or stochastic modelling (SFA) and another by a non-parametric modelling using the Data Envelopment Analysis (DEA) method (Coelli et al., 2005; Galluzzo, 2021a, 2021b; Kumbhakar et al., 2015). The DEA had the positive aspect to estimate multiple inputs and multiple outputs without a priori defined functions of production and other specifications in the model (Coelli et al., 2005; Galluzzo, 2021a, 2021b, 2021c).

Table 1. Input and output variables used in the estimation of the efficiency in Romanian regions.

Variable	Unit	Description
Land	ha	Usable agricultural area
People in agriculture	N°	Workers in the primary sector
Employed	N°	People working in all economic sectors
Poverty	%	Percentage of people at risk of poverty and social exclusion
Emigration	N°	Permanent emigrated people from rural areas
Farm income	€	Total income for farmers
RDP	€	Total payments and subsidies allocated by the second pillar of the CAP

In this research, the DEA approach has been used in an input oriented variable returns to scale (VRS) model with the aim of minimizing inputs in all farms included in the Romanian Farm Accountancy Data Network dataset.

One of the main bottlenecks of the DEA is due to the incapacity in identifying and consequently estimating the inefficiency and inefficient patterns in each input and output variables and this weakness of DEA is effectively overcome by the Multi-directional Efficiency Analysis or MEA (Asmild et al., 2003; Bogetoft & Hougaard, 2003; Hansson et al., 2020). According to these authors, MEA has the advantage of simultaneously estimating efficiency in multi-input and multi-output models and assessing inefficiency in each of inputs and outputs used in the production process (Manevska-Tasevska et al., 2021). The MEA approach makes possible to identify those deviations from the production frontier, expressed in terms of productivity change, that are due to variables not incorporated in the analysis of technical efficiency (Bogetoft & Hougaard, 2003; Hansson et al., 2020). In the assessment of the patterns of inefficiency by the MEA the analysis has evaluated the excess in some variables able to impact to the permanent rural emigration from Romanian rural areas.

MEA scores take a value between zero for totally inefficient farms and 1 for totally efficient farms without any excess in inputs or outputs. Scores of values 1 indicate that there is no potential for improvement on the input/output variable in question while an input efficiency score of less than unity, e.g., 0.7, indicates that farms could reduce the input in question by 30 percent to be efficient. The estimation of the technical efficiency in this research has used for the DEA estimation and MEA approaches the R software packages corrplot, deaR, rDEA and Benchmarking.

4. Results and Discussion

The main results in all investigated Romanian regions have pointed out since 1990 to 2021 a significant amount of people leaving the country. Addressing the analysis to the years of the time series of departure from the residence statistical data published by the Romanian National Institute of Statistics have underlined an intense phenomenon after the collapse of the Berlin wall in particular in rural areas than in urban ones (Figure 1). While the departure from the residence in rural areas since 1999 has stabilized in urban areas statistical data have underlined as the emigration has been higher than in rural areas.

Analyzing in depth the departures from the residence in Romanian rural areas during the time 1990–2021 it emerges as from the North-East region there has been the most significant emigration from the countryside and by contrast from Bucharest-Ilfov there has been the lowest level of emigration from rural areas and this trend has been steady since 1992 (Figure 1). In order to assess if the emigration has a link to the socio-economic fabric, it is useful to use the data about the people employed in the primary sector and the percentage of people at severe risk of poverty and social exclusion.

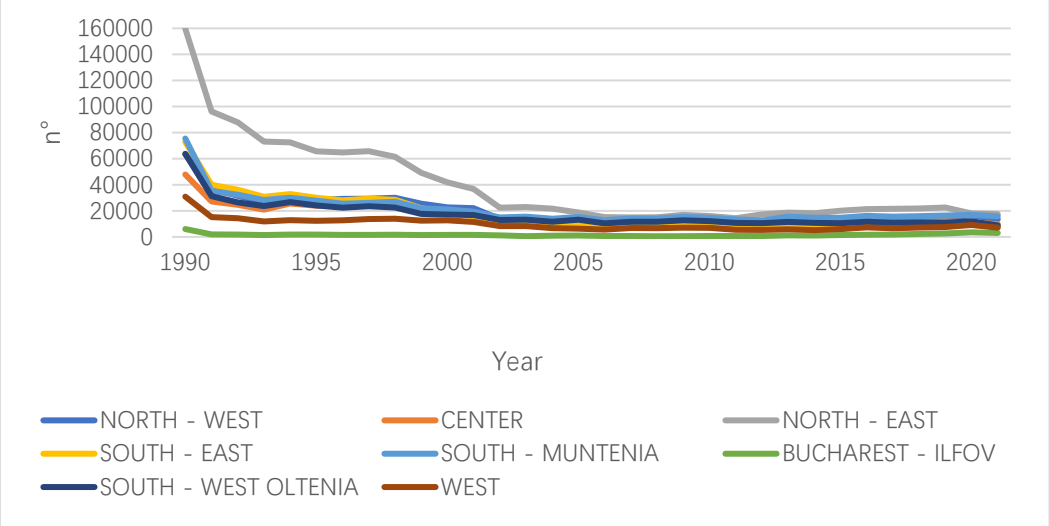

Figure 1. Departures from the residence in Romanian rural areas during the time 1990–2021.

Figure 2 has pointed out as from 2007 to 2020 in all Romanian regions there has been a significant drop of the rate of severe material deprivation. In fact, if in 2007 more than 35% of people was at risk of severe deprivation in the recent years the situation is changed and less than 15% of people is at risk of severe deprivation.

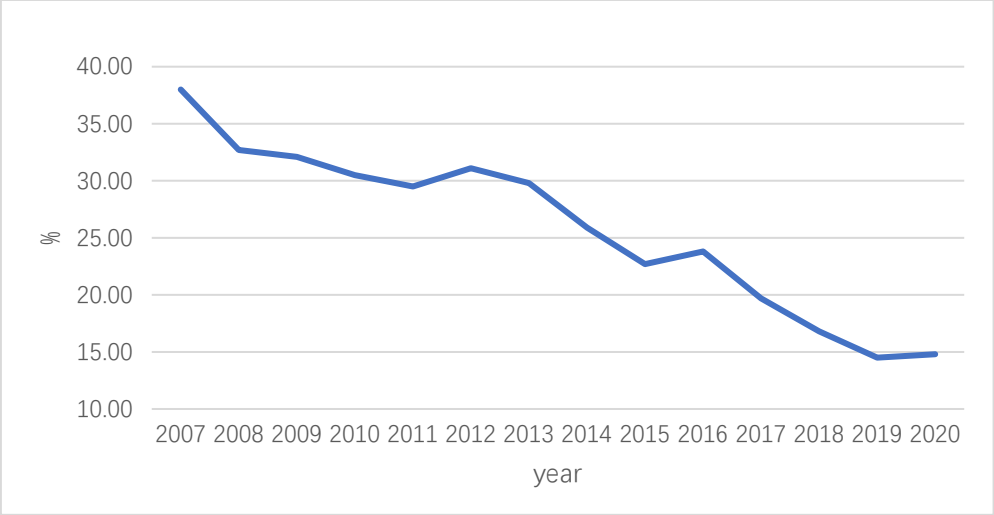

Figure 2. Severe material deprivation rate in all Romanian regions over the time.

Comparing different Romanian regions there are significant disparities over the time of investigation (Table 2). In fact, North-East, South-East and South-Muntenia regions have had the highest value of rate of people at risk of severe deprivation and these regions have pointed out the highest level of permanent departure from rural areas. The West region has had the lowest value of people at risk of poverty and severe deprivation in Romania which is halved in the last years of investigation with a modest increase in 2020 during the Sar-Cov 2 pandemic time.

Table 2. Evolution of percentage of people at risk of severe deprivation in all Romanian regions.

Region	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	***Average region***
North - West	30,4	25,0	24,3	21,8	24,2	22,7	21,9	18,0	16,5	17,6	11,9	9,3	9,0	9,1	*18,6*
Center	29,7	27,3	21,2	19,7	18,9	23,5	27,2	25,0	21,9	18,3	13,2	10,4	9,2	12,6	*19,8*
North - East	43,5	40,5	41,9	40,3	38,6	37,5	34,5	30,4	26,7	23,8	22,4	19,8	17,9	19,4	*31,2*
South - East	43,9	34,3	31,1	38,4	35,2	36,8	38,7	34,4	32,0	29,9	25,8	22,3	20,7	22,7	*31,8*
South - Muntenia	43,6	36,5	36,9	32,2	33,2	35,9	30,0	28,4	26,8	27,5	25,8	23,0	21,7	20,6	*30,1*
Bucharest - Ilfov	34,6	30,8	36,7	30,2	27,4	28,6	27,3	19,8	13,7	25,4	19,1	19,3	11,2	10,1	*23,8*
South - West Oltenia	46,7	39,2	38,1	32,7	31,7	32,6	27,1	25,3	20,8	24,4	22,0	17,8	14,9	14,7	*27,7*
West	25,2	22,8	20,6	22,8	20,4	26,4	28,8	22,7	16,4	22,0	13,8	7,8	7,4	8,6	*18,9*
Average year	*37,2*	*32,1*	*31,4*	*29,8*	*28,7*	*30,5*	*29,4*	*25,5*	*21,9*	*23,6*	*19,3*	*16,2*	*14,0*	*14,7*	

In the same time, it is possible to observe as the rate of people employed in agriculture on the total employees is increased over the time of investigation in Romania (Figure 3). Focusing the attention on the different Romanian regions data have pointed out significant differences even if the highest rate of people working in the agriculture has been found in the counties of South-east and North-East characterized by the highest level of people at risk of severe deprivation and departure (Figure 4).

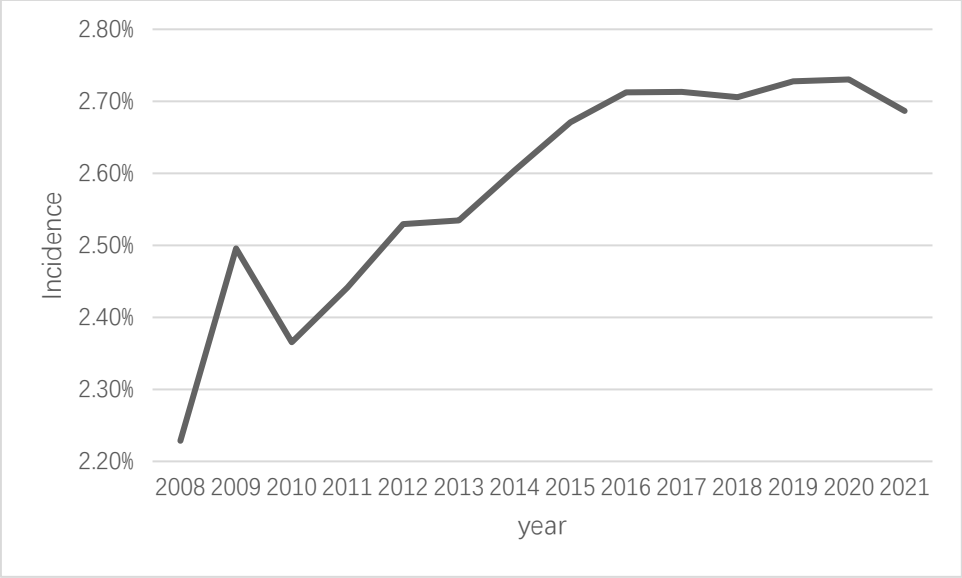

Figure 3. Rate of employees in the primary sector on the total employees at level of CANE Rev.2.

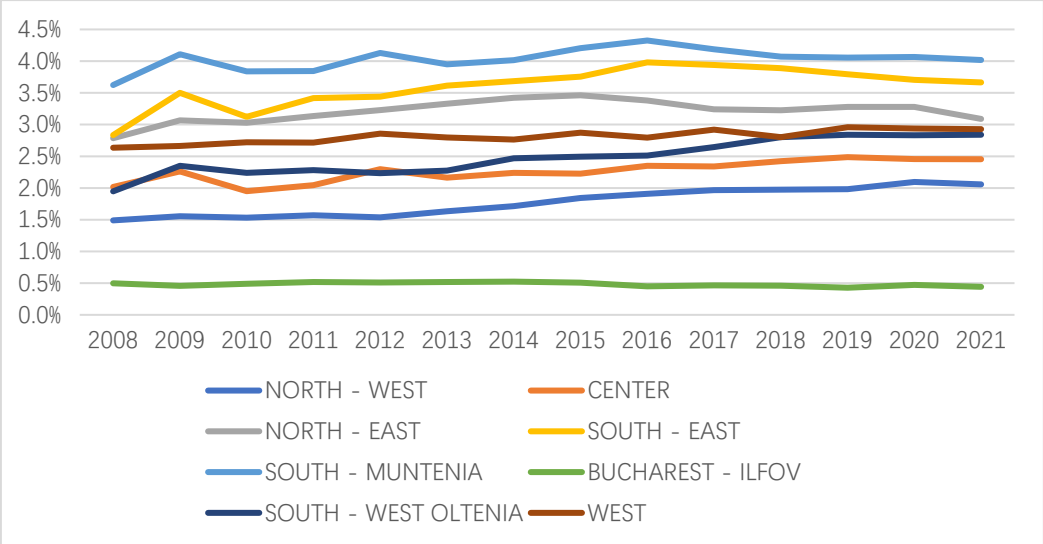

Figure 4. Rate of employees in the primary sector on the total employees in all Romanian regions.

In terms of permanent emigration all Romanian regions the research's findings have pointed out a significant decrease after the collapse of the Berlin wall and an increase, with some fluctuations over the time of investigation 1990–2021, even if since 2010 there has been a constant increase of permanent emigration (Figure 5).

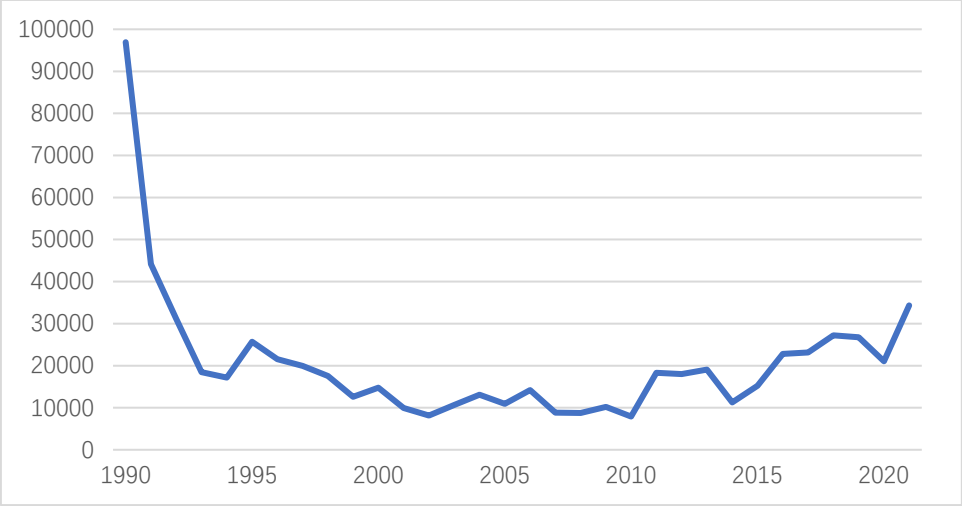

Figure 5. Permanent emigration in Romania over the time of investigation.

Focusing the attention to the main Romanian counties it emerges significant fluctuations over the time of study in particular in South-East, North East and in Bucharest Ilfov regions (Figure 6).

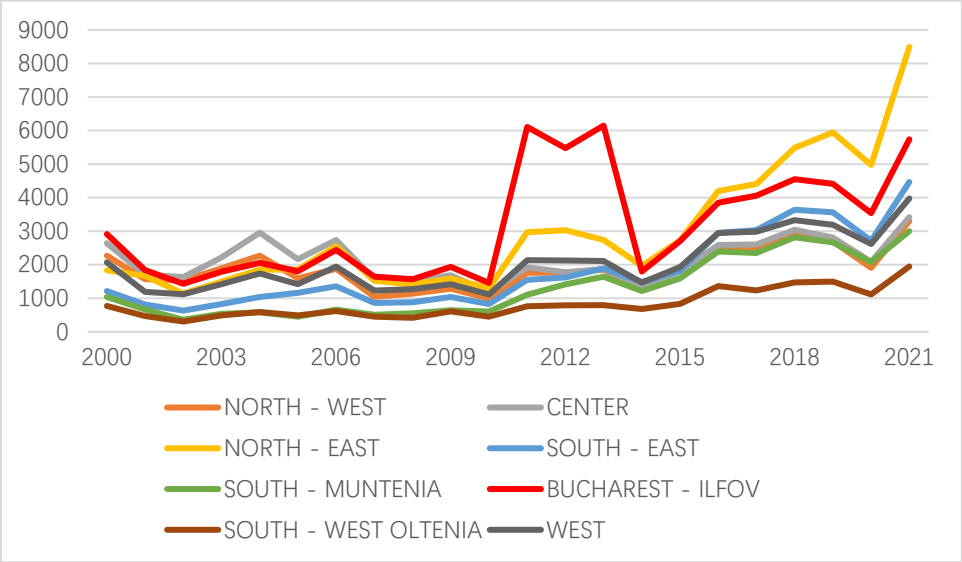

Figure 6. Permanent emigration in the main Romanian regions.

The analysis of descriptive statistic in data published by the Romanian Institute of Statistics and by the FADN dataset have pointed out as the total CAP subsidies are predominant and both the financial subsides allocated by the second pillar of the CAP and also the payments to farms located in disadvantaged rural areas (LFA payments) represented a poor share close in average value in a range between 0-381 euro (Table 3). The average value of land capital is close to 12.5 hectares under the average value of the European Union which is close to 16 hectares. It is important also to underline as the people employed in the primary sector is 25% of the total employed people in Romania even if it is fundamental to observe as the share of people at risk of poverty and severe social exclusion is on average close to 38%.

Table 3. Main descriptive statistics in all investigated variable used in the estimation of efficiency.

Variable	Mean	Std. Dev.	Min	Max
Less Favored Areas subsidies	22.36	53.54	0	381
RDP payments	86.88	160.14	0	1295
Land Capital	12.49	6.14	5.44	38.28
Total CAP subsidies	2613.46	1601.59	662	6991
Emigrated people	1131959	504901.2	223521	1921582
Employed people	1048.15	174.39	657.6	1425
People employed in agriculture	253.57	127.33	15	508.4
Rate of employment	65.17	9.65	49.3	90.4
Rate of people at risk of social exclusion	37.87	9.86	12.6	56.6

Table 4 showed the main descriptive statistics assessed in all 8 Romanian regions. Research's findings have pointed out as the highest value of payments allocated by the rural development program has been assessed in South-East, North-East and Centre regions. In North-East has been found the lowest level of land capital in farms that has been under the 8 hectares. In Bucharest-Ilfov region farmers have received the highest number of total payments and subsides allocated by the CAP while farmers in South-West-Oltenia have got the poor level of CAP financial subsidies. Apart from the Bucharest-Ilfov, North-East and South-Muntenia regions, the analysis has pointed out as the higher is the level of emigration the higher is people employed in agriculture and people at risk of severe social exclusion and deprivation.

The analysis of the correlation in the main investigated variables has pointed out as between emigration people and people employed in the primary sector there is a significant direct correlation on the contrary between emigrated people and employment rate there is an indirect correlation hence, a poor level of emigration is linked to a high level of employed people (Figure 7). Drawing some conclusions, the higher is the percentage of people at risk of social exclusion and poverty the higher is the emigration.

Table 4. Main descriptive statistics in all Romanian regions.

Region	RDP payments (€)	Land Capital (ha)	Total CAP subsidies (€)	Emigrated people (n°)	People employed in agriculture (000)	Rate of people at risk of social exclusion (%)
Bucharest-Ilfov	0	17.90	3918.92	253358.5	31.37	26.94
Center	172.42	11.14	2929.64	991437.5	203.77	31
North-East	43.07	8.45	1571	1879028	409.52	48.83
North-West	170.57	9.08	2095	1219218	304.77	29.23
South-East	156.28	16.96	3441.92	1141837	276.57	29.23
South-Muntenia	48.28	12.88	2523.78	1809253	356.53	41.54
South-West-Oltenia	18.21	7.81	1391.64	1062861	275.36	45.24
West	80	16.07	3129.07	698679	170.63	33.33
Total	*86.88*	*12.49*	*2613.46*	*1131959*	*253.57*	*37.87*

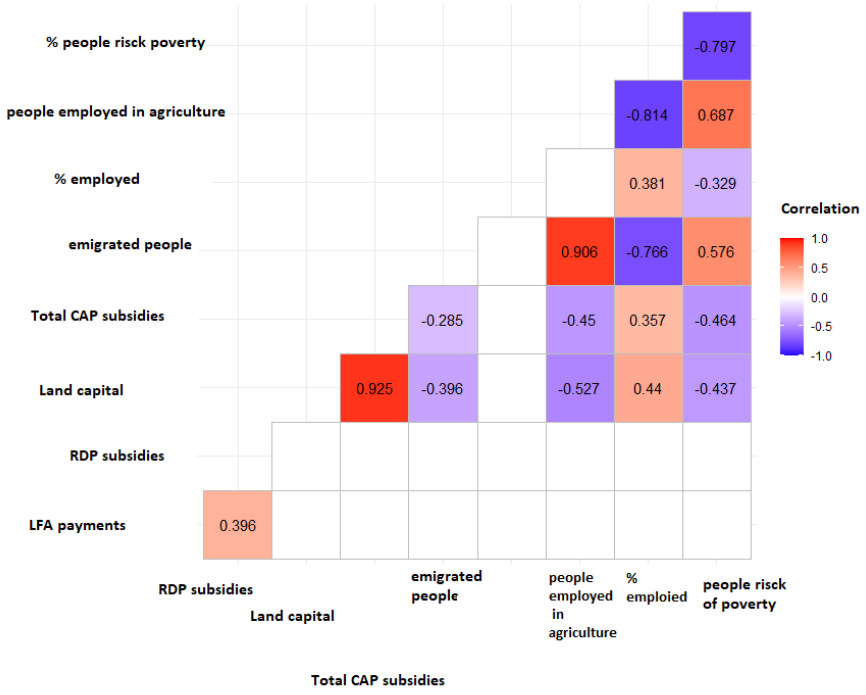

Figure 7. Main correlations with a significant at 5% in all investigated variables since 2010–2020 time. In white there are no correlations among variables.

The elaboration of the estimation of efficiency and the patterns of inefficiency in all Romanian counties have pointed out as in general the level of efficiency is almost high close to 0.95 (Table 5).

Table 5. Main results of efficiency estimated by DEA and MEA in all Romanian regions.

Variable	Mean	Std. deviation
DEA	0.947	0.093
MEA Land Capital	0.953	0.094
MEA people working in agriculture	0.961	0.110
MEA total employment	0.993	0.014
MEA risk of poverty	0.988	0.021
MEA emigrated people	0.976	0.045
MEA farmers income	0.965	0.059
MEA RDP subsidies	0.738	0.367

The patterns of inefficiency have underlined as the variable RDP subsidies has been the less efficient than the other inputs and output used in the estimation; in particular the total employment and the people at risk of poverty and severe deprivation have been less inefficient. By some maps it has been possible to compare the differences in terms of efficiency and in the patters of inefficiency in all Romanian regions. In this case we used three different colors green to show the highest level of efficiency and the poor level of inefficiency and red for the highest level of inefficiency and lowest level of efficiency, the yellow color indicates a middle way.

The highest level of efficiency has been assessed in four Romanian regions out of height and in particular in Centre, North-East, South-Muntenia and North-West with value above 0.97 (Figure 8). The lowest value of efficiency has been found in West, Bucharest-Ilfov and South West Romanian regions with a value above 0.90.

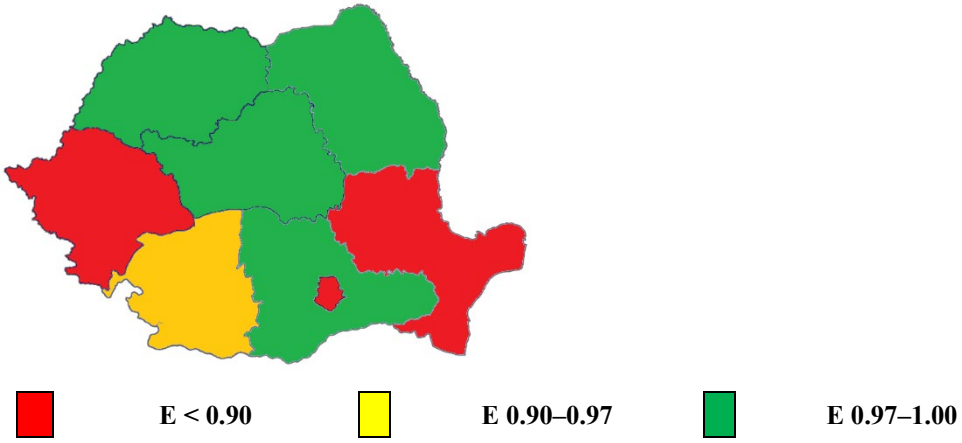

Figure 8. Efficiency (E) estimated by the DEA approach in each Romanian region.

Addressing the attention to the pattern of inefficiency in the input land capital (Figure 9) research's findings pointed out as the highest value in terms of efficient use of this input in Center, North-East, North-West and Bucharest-Ilfov regions, on the contrary West and South- West Romanian regions have underlined an inefficient use of this input.

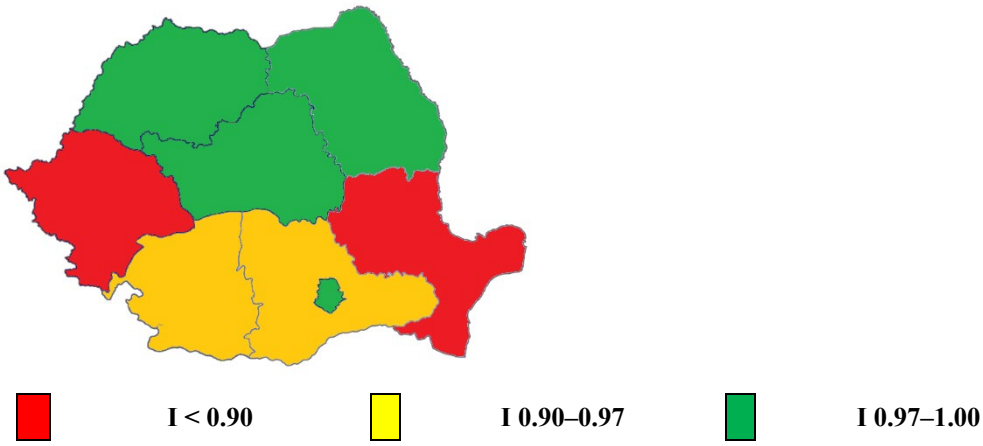

Figure 9. Estimation of inefficiency patterns (I) by the MEA approach in land capital variable.

Farm net income has had the lowest value of inefficient use both for the variable farm's income and also for the variable people at risk of poverty hence, over the time of investigation there has been an intense drop of the people at risk of severe deprivation and exclusion (Figure 10). Figure 10 showed also as except for the region of Bucharest-Ilfov and South-West in all Romanian regions people employed in agriculture is a variable which is not able to cause an inefficient use of this variable and the same results have been found addressing the attention to the percentage of employed people in all Romanian regions.

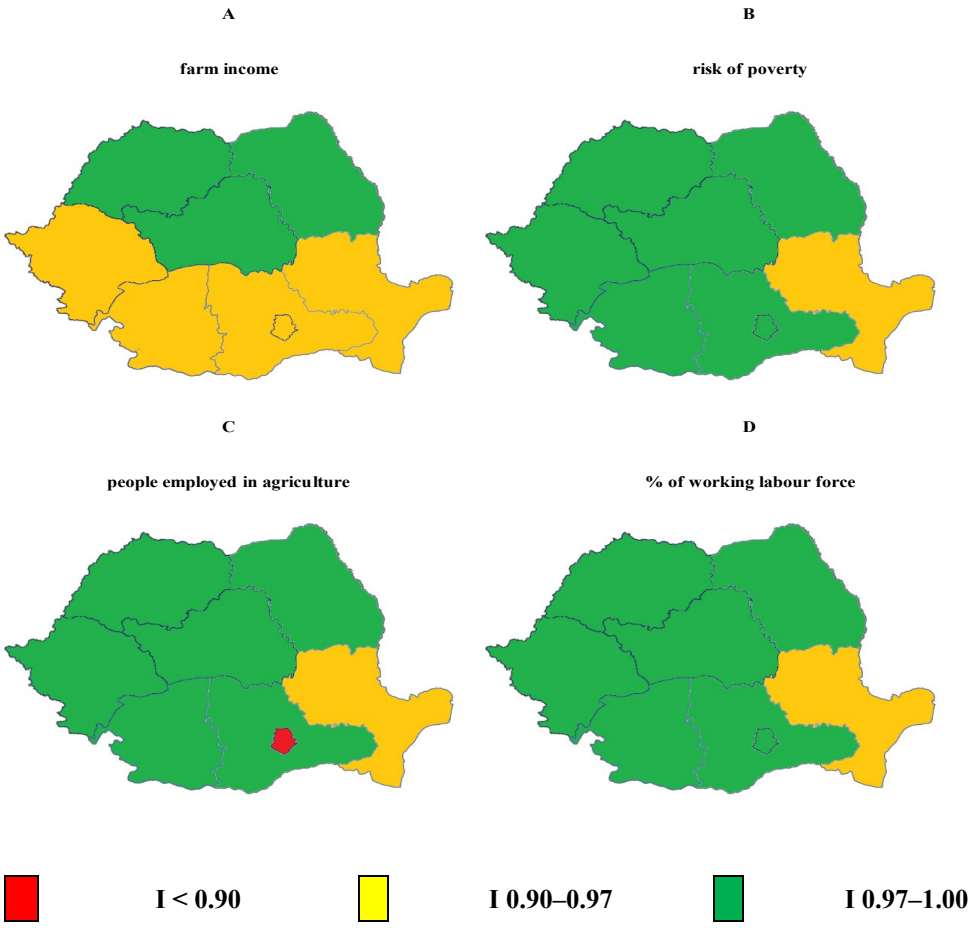

Figure 10. Main results of the inefficient (I) estimated by MEA in the use of farm income, risk of poverty, people employed in agriculture and percentage of working labor force variables.

In five counties out of eight the variable people emigrated has not inefficient apart from the South-West regions that has had the highest level of inefficiency in this variable which implies a significant action in order to halt this phenomenon of emigration from the rural areas (Figure 11). On the contrary, the allocation of subsides by the second pillar of the CAP in order to stimulate the rural development in Romanian rural areas has pointed out a mixed result. In fact, only in the Central region it has been possible to find a low level of inefficiency and in South-West-Oltenia, Bucharest-Ilfov and in South-West it has been possible to assess the highest level of inefficiency in the allocation of these kind of subsidies.

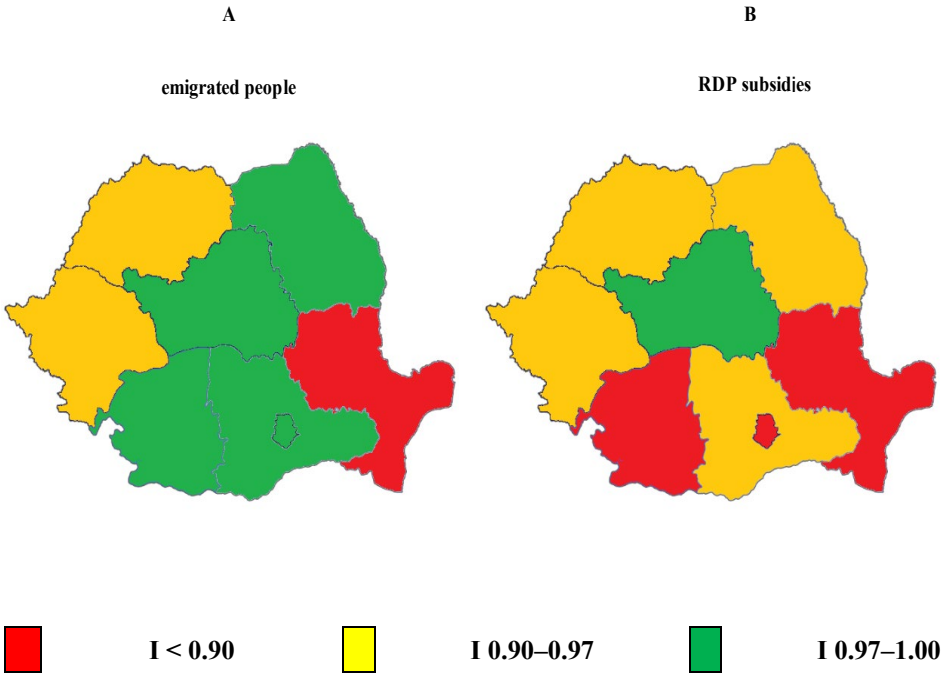

Figure 11. Main results of the inefficient patterns (I) in two investigated variables such as emigrated people and total subsidies allocated by the second pillar of the CAP.

5. Discussion and Conclusions

The present study has corroborated as the emigration in Romanian rural areas is a multidimensional topic that needs of different quantitative approaches of investigation as carried out in this paper. In fact, results have corroborated the theoretical hypothesis proposed by Sandy in 2005 in using a multidimensional approach in order to face with studies about permanent emigration.

The research's findings have underlined as the CAP subsidies are a fundamental tool for the socio-economic development of Romanian regions because of the financial subsidies and payments have had a significant impact to the emigration from the countryside as argued by other studies (Galluzzo, 2021a, 2021b; Mitrică et al., 2022).

As proposed by Mitrică et al. in 2022, the emigration has been typical of southern Romanian regions which seem to be very sensitive to some socioeconomic variables used in this study such as risk of poverty, employed people and subsidies allocated by the CAP. Results have pointed out as people emigrated from the South-West and South-Muntenia are typical of regions characterized by small farms with a modest impact of financial subsidies allocated by the second pillar of the CAP and by the highest share of people at risk of poverty and social exclusion and this has been in line with something proposed by other studies (Mitrică et al., 2019, 2022) according to which in these two regions higher has been the emigration and people seem to be characterized by low skills. This has corroborated as the variable people at risk of social exclusion is one of the main drivers able to push people to emigrate.

This study held the light about the role of subsidies allocated by public policy such as the Common Agricultural Policy and the emigration, underlining the fundamental role of subsided in less favored areas in order to reduce the emigration from rural areas even if the impact of CAP and emigration can be mixed at this stage of investigation (Galluzzo, 2016, 2021b). For the future it is important to boost the financial subsidies to rural areas with a specific and well-defined approach addressed to small farms located in rural areas at risk of marginalization where the diversification by agritourism can be a strategic leverage in reducing the emigration form the Romanian countryside.

In general, this study has underlined as there are some unbalances among all Romanian regions with the Bucharest-Ilfov receiving the highest amount of CAP subsidies. Drawing some conclusions, this research has pointed out as an increase of subsidies allocated by the second pillar of the CAP is not efficient as corroborated by the MEA approach. Furthermore, regions with a significant share of people at risk of poverty and people employed in agriculture have suffered a significant increase of permanent emigration as corroborated by the analysis of patter of inefficiency as well. Hence, it is important to improve the efficiency of the subsidies allocated by the Rural Development Program that has pointed out a different effect in all investigated Romanian regions. In particular, the Nort-East region has had the worst results in terms of efficiency in all investigated

variables and where very intense has been the permanent emigration from the rural areas. In conclusion, South-West and North-West regions have been the areas where higher has been the poverty rate and the share of people working in agriculture that has been able to demonstrate as the higher is the deprivation in socio-economic way and the higher is the emigration in rural areas than in urban ones. For a correct management of policy of emigration and immigration in Romanian rural areas it is crucial to define specific measures in the rural development program with the purpose to reduce the marginalization of the rural space and to improve job opportunities in farms and in other enterprises well-rooted in the countryside. In this perspective, measures of farm's diversification, on-farm activities, rural tourism and agritourism are fundamental strategic leverages of development versus permanent emigration in Romanian rural areas.

CRediT Author Statement: This is a single author paper and the author was solely responsible for the content, including the concept, design, analysis, writing, and revision of the manuscript.

Data Availability Statement: The data supporting the findings of this study are openly avai-lable at https://agridata.ec.europa.eu/extensions/FADNPublicDatabase/FADNPublicDatabase.html; http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table and https://ec.europa.eu/eurostat/data/database.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

Acknowledgments: Not applicable.

References

Anghel, R. G. (2016). Migration in differentiated localities: changing statuses and ethnic relations in a multi-ethnic locality in Transylvania, Romania. *Population Space and Place*, *22*(4), 356–366. https://doi.org/10.1002/psp.1925

Anghel, R. G., Botezat, A., Coșciug, A., Manafi, I., & Roman, M. (2017). International migration, return migration, and their effects: A comprehensive review on the Romanian case. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2895293

Asmild, M., Hougaard, J. L., Kronborg, D., & Kvist, H. K. (2003). Measuring inefficiency via potential improvements. *Journal of Productivity Analysis*, *19*(1), 59–76. https://doi.org/10.1023/A:1021822103696

Bogetoft, P., & Hougaard, J. L. (2003). Rational inefficiencies. *Journal of Productivity Analysis*, *20*(3), 243–271. https://doi.org/10.1023/A:1027347616038

Bojnec, Š., & Fertő, I. (2022). Do different types of common agricultural policy subsidies promote farm employment? *Land Use Policy*, *112*, 105823. https://doi.org/10.1016/j.landusepol.2021.105823.

Botezat, A., Moraru, A., & Botezat, D. (2016). *Romania's medical exodus. Evidence from LinkedIn data*. Munich Personal RePEc Archive.

Coelli, T. J., Rao, D. S. P., O'Donnell, C. J., & Battese, G. E. (2005). *An introduction to efficiency and productivity analysis*. Springer Science & Business Media.

EUROSTAT. (2019). *Eurostat database*. https://ec.europa.eu/eurostat/data/database

Galluzzo, N. (2016). Role of financial subsidies allocated by the CAP and out emigration in Romanian rural areas. *Annals of Constantin Brancusi University of Targu-Jiu. Economy Series*, *3*, 218–224.

Galluzzo, N. (2021a). The role of CAP subsidies in reducing socio-economic marginalization in Romanian rural areas. *Bulgarian Journal of Agricultural Science*, *27*(4), 633–645.

Galluzzo, N. (2021b). Estimation of the impact of CAP subsidies as environmental variables on Romanian farms. Economia Agroalimentare, *22*(3), 1–24. https://doi.org/10.3280/ecag2021oa12772

Galluzzo, N. (2021c). A quantitative analysis on Romanian rural areas, agritourism and the impacts of European Union's financial subsidies. *Journal of Rural Studies*, *82*, 458–467. https://doi.org/10.1016/j.jrurstud.2021.01.025

Garrone, M., Emmers, D., Lee, H., Olper, A., & Swinnen, J. (2019). Subsidies and agricultural productivity in the EU. *Agricultural Economics*, *50*(6), 803–817. https://doi.org/10.1111/agec.12526

Gavrilescu, C., Tudor, M. M., Brumă, I. S., Dobay, K. M., Matei, D., & Tănasă, L. (2020). Demographic change and labour availability in agricultural farms in North-East region of Romania. *Agricultural Economics and Rural Development*, *17*(2), 169–182.

Hansson, H., Manevska-Tasevska, G., & Asmild, M. (2020). Rationalising inefficiency in agricultural production–the case of Swedish dairy agriculture. *European Review of Agricultural Economics*, *47*(1), 1–24. https://doi.org/10.1093/erae/jby042

Ianoș, I. (2016). Causal relationships between economic dynamics and migration: Romania as case study. In J. Domínguez-Mujica (Ed.), *Global change and human mobility* (pp. 303–322). Springer Singapore. https://doi.org/10.1007/978-981-10-0050-8_16

Ianoș, I., Sîrodoev, I., Pascariu, G., & Henebry, G. (2016). Divergent patterns of built-up urban space growth following post-socialist changes. *Urban Studies*, *53*(15), 3172–3188. https://doi.org/10.1177/0042098015608568

Iordache, M., & Titan, E. (2022). Does Romanian emigration influence labour force? *Journal of Economics, Finance and Management Studies*, *5*, 2644–0504. https://doi.org/10.47191/jefms/v5-i10-03

Kuiper, M., Shutes, L., Van Meijl, H., Oudendag, D., & Tabeau, A. (2020). Labor supply assumptions. A missing link in food security projections. *Global Food Security*, *25*, 100328. https://doi.org/10.1016/j.gfs.2019.100328

Kumbhakar, S. C., Wang, H., & Horncastle, A. P. (2015). *A practitioner's guide to stochastic frontier analysis using Stata*. Cambridge University Press. https://doi.org/10.1017/CBO9781139342070

Manevska-Tasevska, G., Hansson, H., Asmild, M., & Surry, Y. (2021). Exploring the regional efficiency of the Swedish agricultural sector during the CAP reforms–multi-directional efficiency analysis approach. *Land Use Policy*, *100*, 104897. https://doi.org/10.1016/j.landusepol.2020.104897

Minviel, J. J., & Latruffe, L. (2017). Effect of public subsidies on farm technical efficiency: A meta-analysis of empirical results. *Applied Economics*, *49*(2), 213–226. https://doi.org/10.1080/00036846.2016.1194963

Mitrică, B., Damian, N., Grigorescu, I., Mocanu, I., Dumitrașcu, M., & Persu, M. (2022). Out-migration and social and technological marginalization in Romania. *Regional disparities. Technological Forecasting and Social Change*, *175*, 121370. https://doi.org/10.1016/j.techfore.2021.121370

Mitrică, B., Damian, N., Mocanu, I., & Grigorescu, I. (2019). Exploring the links between out-migration and social development in Romania. A development region-based approach. *Europa XXI*, *37*, 53–70. https://doi.org/10.7.7163/Eu21.2019.37.4

Roman, M., & Voicu, C. (2010). Some socio-economic effects of labour migration on the sending country. Evidence from Romania. *Economie teoretică şi aplicată*, *7*(548), 50–65.

Sandu, D. (2005). Dynamics of Romanian emigration after 1989: From a macro-to a micro-level approach. *International Journal of Sociology*, *35*(3), 36–56. https://doi.org/10.1080/00207659.2005.11043153

Tomescu-Dumitrescu, C. (2017). Migraţia în România şi perspectivele demografice. *Analele Universităţii Constantin Brâncuşi, Serie Litere şi Ştiinţe Sociale*, 79–86.

World Economic Forum. (2017). *Migration and its impact on cities*. http://www3.weforum.org/docs/Migration_Impact_Cities_report_2017_low.pdf