Business Administration and Business Economics

New European Union Faces to New Poverty Challenge

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Abstract: The paper is focused on the analysis of the correlation between economic development and poverty across the EU. The "surprise" is that many Member States face to high poverty and social exclusion rates in 2017 and the forecast are not too optimistic. The analysis in the paper follows more steps: a comparative analysis focused on child poverty rate, a regression analysis able to point out the disparities between Member States and a cluster analysis, as well. In order to obtain a better approach and better conclusions, forecasting procedures are used on short time. Finally, a cross-correlation analysis is used in order to express the compatibility between the poverty's evolution in each Member States vs EU average. The main conclusion of the paper is that of the impossibility to solve the poverty's challenge on short and medium terms in EU. Moreover, Member States can define three clusters under this indicator. This is the main reason to continue the present research to a new analysis of the poverty's challenge in the context of the new EU's approach.

Keywords: Child poverty rate; social exclusion; regional disparities; cross-correlation analysis.

JEL Classification: R10l; R11; R13

1. Introduction

The 56th session of the intergovernmental body under the UN Economic and Social Council put into attention as 1st goal the eradication of the poverty in all its manifestations over the next 15 years. (United Nations, 2018)

European Union is interested in solving this challenge for its EU citizens, in order to cover the basic needs for the poorest and most vulnerable categories.

As a result, the 5th target of the Europe 2020 Strategy was defined as Poverty and social exclusion and is quantified as at least 20 million fewer people in - or at risk of - poverty/social exclusion. (European Commission, 2010)

Unfortunately, the present EU is pressed by Brexit's spectrum and is more interesting

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in its future structure, management and power balance than in poverty's eradication. This is why some specialists put into discussion the implications of Brexit for the lives of the citizens. (Benson, Collins & O'Reilly, 2018)

Nowadays, EU is not able to eradicate the poverty and social exclusion in its Member States. Moreover, there great disparities between these states.

The paper analyses the disparities related to poverty and social exclusion across the EU and their trend until the beginning of the new financial perspective.

2. Literature Overview

The poverty and social exclusion represent important research themes for the European specialists. The poverty phenomenon became more relevant during the recent global economic crisis. It was followed by recession in many Member States. As a result, some specialists put into discussion the quantifying procedures related to the poverty analysis in the context of Europe 2020 Strategy's targets. This analysis covered Ireland during 2004-2009 and was focused on risk of poverty, material deprivation and consistent poverty. The main conclusion of the analysis was the necessity of using a number of core and supporting indicators in monitoring social exclusion. (Watson & Maître, 2012)

The poverty phenomenon affects especially the children. An interesting analysis based on UNICEF's support was focused on child poverty rate. This rate is considered to be the percentage of children living in households with an equivalent income lower than 50% of the national median. The study points out the challenges for all world economies connected to poverty across children and concludes that this problem is far away of being solved. In order to support this pessimistic conclusion, the author shows that USA faces to a high child poverty rate of 23.1%. Moreover, many EU states face to high child poverty rates, too (see Figure 1).





Figure 1. Child poverty rate Source: Author's contribution using http://www.unicefirc.org/publications/pdf/rc10_eng.pdf

Moreover, other developed countries face to high child poverty rates: Norway, Switzerland, Australia, New Zealand, Canada or Japan. (Kinoshita, 2013)

A macroeconomic case study is focused on the individuals living in poverty in the UK. The approach is a pessimistic one because the author considers that the poverty is expected to rise. The analysis puts together poverty, poor health, low educational attainment and employability and reduced life expectancy in order to explain that poverty doesn't mean only few moneys. On the other hand, the author proposes the Capabilities Approach as relevant measure of poverty. These capabilities represent a sum of specific indicators able to quantify better the poverty. (O'Hare, 2014)

The relationship between material deprivation and relative income poverty across the EU28 countries was analysed in order to quantify the cross-country variation in those at risk of consistent poverty. The analysis in the paper is built on the following items: a correlation analysis able to investigate the relationship between poverty concepts and their measures; an analysis of the poverty identification patterns of the population; and a multivariate regression analysis. The analysis concluded that consistent poverty is highest in the new EU Member States and the EU Southern countries. On the other hand, the poverty intensity depends on the household structure, level of education of the household head and work intensity of the household. (Kis & Gábos, 2015)

A different approach is that related to inequality and poverty across generations in EU. The authors started from the idea that the evolution of inequality within EU

countries is mixed. The recent global economic crisis brought new challenges related to poverty. The risk of poverty increased significantly for the young and the working age population, while it declined sharply for the elderly. The market mechanisms and the public policies led to high unemployment rates for young labour and to lower youth incomes and greater risk of youth poverty. On the other hand, the recent public policies regarding the fiscal consolidation were more focused on programs helping the working age population rather than the elderly. And their effects cover poverty, too. The main conclusion of the analysis is that the present EU public policies are not able to solve the poverty's challenge and is necessary a new economic and social approach. (Chen, Hallaert, Pitt, Qu, Queyranne, Rhee, Anna Shabunina, Vandenbussche & Yackovlev, 2018)

3. Research Methodology

The analysis in the paper uses the latest official statistical data. The first step of the analysis consists of trend and comparative analyses and is based on graphic approach.

They are followed by regression analysis able to point out the disparities between the Member States. The dependent variables are the individual poverty rates, while the independent variable is time. The curve estimation is realized under ANOVA conditions.

The next step of the analysis is a cluster approach. The Member States are grouped into three clusters. The average value of the silhouette will be certified or not the availability of the approach.

In order to point out the trend of the poverty across the EU, forecasting procedures are used. These procedures use as dependent variable the annual poverty rates and as independent variable time. The forecast is realized under ARIMA condition.

Finally, a cross-correlation analysis is realized in order to express the comparative evolution of the indicator in each Member State vs EU average.

4. Poverty's Challenge for the European Union

As general trend, the poverty and social exclusion rate decreased across the EU28 during 2012-2016. Unfortunately, the latest official statistical data stop in 2016 (see Figure 2).



Figure 2. People at risk of poverty and social exclusion (% total population)

Source: Author's contribution using European Commission's data, 2018

Bulgaria (40.4%), Romania (38.8%), Greece (35.6%), Lithuania (30.1%) and Italy (30.0%) faced to the greatest poverty and social exclusion rates in 2016. On the other hand, the people at risk of poverty and social exclusion increased in Estonia, France, Italy, Lithuania, Luxembourg, Netherlands and Romania compared to the previous year.

The global economic crisis had powerfully effect on poverty rate in the EU28. As a result, the top value of the poverty and social exclusion rate was achieved in 2012, at the end of the economic recovery in almost all Member States.

The most integrated EU economies (Germany, France, Belgium, Netherlands and Luxembourg) achieved ones of the lowest rates (between 16.7% and 20.7%).

The gap between the greatest (Bulgaria, 40.4%) and the lowest (Czech Republic, 13.3%) poverty and social exclusion rates was 3.04: 1.

There are great disparities regarding this rate between EU's economies. The regression leads to the situation presented in Figure 3.



Figure 3. Disparities related to people at risk of poverty and social exclusion (% total population)

Source: Author's contribution using IBM-SPSS 25

Austria; 2. Belgium: 3. Bulgaria; 4. Croatia; 5. Cyprus; 6. Czech Rep.; 7. Denmark; 8. Estonia; 9. Finland; 10. France; 11. Germany; 12. Greece; 13. Hungary; 14. Ireland; 15. Italy; 16. Latvia; 17. Lithuania; 18. Luxembourg; 19. Malta; 20. Netherlands; 21. Poland; 22. Portugal; 23. Romania; 24. Slovakia; 25. Slovenia; 26. Spain; 27. Sweden; 28. UK

The economic performances regarding this indicator allow dividing the Member States into three clusters. The first one covers countries with poverty and social exclusion rates lower than 20.0% of total population (Austria, Czech Republic, Denmark, Finland, France, Germany, Luxembourg, Netherlands, Slovakia, Slovenia and Sweden). The second cluster is formed from countries with poverty and social exclusion rates between 20.0% and 30.0% (Belgium, Croatia, Cyprus, Estonia, Hungary, Ireland, Latvia, Malta, Poland, Portugal, Spain and UK). The third one is focused on countries with poverty and social exclusion rates up to 30.0% (Bulgaria, Greece, Italy, Lithuania and Romania). The cluster approach is supported by very good (0.8) average silhouette (see Figure 4).



Figure 4. Cluster approach to people at risk of poverty and social exclusion (% total population) Source: Author's contribution using IBM-SPSS 25

5. To a better Future?

In order to demonstrate the viability of the EU strategy regarding the poverty's decreasing, specific forecasting procedures are usefully. EU27 will face to lower poverty rates until 2020. The analysis of EU27 is used in connection to the future Brexit. The forecasted results are presented in Figure 5.



Figure 5. People at risk of poverty and social exclusion's forecasting (% total population)

Source: author's contribution using IBM-SPSS 25

According to the above figure, an inflexion point is observed in 2017. Even that the decrease in the poverty rate will become constant during 2017-2020, the obsolete values of the indicator will lead to no better situation at the end of the forecasting period.

The disparities related to this indicator between the Member States in 2016 and at the end of the forecasting period are presented in Table 1.

Country	2016	2020	Evolution
Austria	18.0	17.8	-
Belgium	20.7	20.9	+
Bulgaria	40.4	32.5	-
Croatia	27.9	25.4	-
Cyprus	27.7	31.4	+
Czech Rep.	13.3	12.9	-
Denmark	16.7	16.7	
Estonia	24.4	27.0	+
Finland	16.6	16.2	-
France	18.2	16.9	-
Germany	19.7	20.3	+
Greece	35.6	42.4	+

Table 1. Poverty rates on Member States (% of total population)

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Hungary	26.3	26.1	-
Ireland	24.2	23.2	-
Italy	30.0	32.0	+
Latvia	28.5	21.8	-
Lithuania	30.1	24.9	-
Luxembourg	19.8	21.4	+
Malta	20.1	21.9	+
Netherlands	16.7	17.8	+
Poland	21.9	18.5	-
Portugal	25.1	27.5	+
Romania	38.8	36.1	-
Slovakia	18.1	16.0	-
Slovenia	18.4	19.4	+
Spain	27.9	30.4	+
Sweden	18.3	18.8	+

Only 13 Member States will succeed in decreasing the poverty rates in 2020 compared to 2016, while Denmark will maintain its poverty rate.

On the other hand, the gap between the greatest (Greece, 42.4%) and lowest (Czech Republic, 12.9%) poverty rates will increase to 3.29:1 in 2020.

The cross-correlation analysis points out the connections between each Member State and EU average regarding trends and obsolete values during the analysis period (2010-2020). The resulting data are presented in Tables 2-28.

Series F	Pair: Austria with EU	J	Series I a	m. Deigium with De	·
	Cross		Lag	Cross Correlation	Std. Error
Lag	Correlation	Std. Error	-7	143	.500
-7	389	.500	-6	091	.447
-6	394	.447	-5	158	.408
-5	275	.408	-4	192	.378
-4	186	.378	-3	.095	.354
-3	.082	.354	-2	.014	.333
-2	.426	.333	-1	.290	.316
-1	.512	.316	0	.650	.302
0	.668	.302	1	.243	.316
1	.587	.316	2	.091	.333
2	.332	.333	3	111	.354
3	.210	.354	4	283	.378
4	011	.378	5	150	.408
5	335	.408	6	054	.447
-	- 370	.447	7	067	.500
6			-		
6 7	188	.500			
6 7	188	.500			
6 7 Series P	188 Pair: Bulgaria with E	.500 U	Series F	Pair: Croatia with EU	J
6 7 Series P	188 Pair: Bulgaria with E Cross	.500 U	Series F	Pair: Croatia with EU Cross	J
6 7 Series P Lag	188 Pair: Bulgaria with E Cross Correlation	.500 U Std. Error	Series F	Pair: Croatia with EU Cross Correlation	J Std. Error
6 7 Series P Lag -7	188 Pair: Bulgaria with E Cross Correlation 437	.500 U Std. Error .500	Series F Lag -7	Pair: Croatia with EU Cross Correlation 432	J Std. Error .500
6 7 Series P Lag -7 -6	188 Pair: Bulgaria with E Cross Correlation 437 475	.500 U Std. Error .500 .447	Series F Lag -7 -6	Pair: Croatia with EU Cross Correlation 432 459	500 .447
6 7 Series P Lag -7 -6 -5	Pair: Bulgaria with E Cross Correlation 437 475 269	.500 U Std. Error .500 .447 .408	Series F Lag -7 -6 -5	Pair: Croatia with EU Cross Correlation 432 459 288	Std. Error .500 .447 .408
6 7 Series P Lag -7 -6 -5 -4	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039	.500 U Std. Error .500 .447 .408 .378	Series F Lag -7 -6 -5 -4	Pair: Croatia with EU Cross Correlation 432 459 288 013	Std. Error .500 .447 .408 .378
6 7 Series P <u>Lag</u> -7 -6 -5 -4 -3	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091	.500 U Std. Error .500 .447 .408 .378 .354	Series F Lag -7 -6 -5 -4 -3	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138	Std. Error .500 .447 .408 .378 .354
6 7 Series P <u>Lag</u> -7 -6 -5 -4 -3 -2	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192	.500 U Std. Error .500 .447 .408 .378 .354 .333	Series F Lag -7 -6 -5 -4 -3 -2	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205	Std. Error .500 .447 .408 .378 .354 .333
6 7 Series P Lag -7 -6 -5 -4 -3 -2 -1	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445	.500 U Std. Error .500 .447 .408 .378 .354 .354 .333 .316	Series F Lag -7 -6 -5 -4 -3 -2 -1	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410	Std. Error .500 .447 .408 .378 .354 .354 .333 .316
6 7 Series P Lag -7 -6 -5 -4 -3 -2 -1 0	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670	.500 U Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series F Lag -7 -6 -5 -4 -3 -2 -1 0	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722	Std. Error .500 .447 .408 .378 .354 .333 .316 .302
6 7 Series P <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775	.500 U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722 .765	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316
6 7 Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775 .602	.500 U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .302 .316 .333	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722 .765 .596	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333
6 7 Series P <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775 .602 .177	.500 U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722 .765 .596 .209	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333
6 7 Series P -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775 .602 .177 .103	.500 U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .3354 .378	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 2.005 .410 .722 .765 .596 .209 157	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378
6 7 Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775 .602 .177 103 277	.500 U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .333 .354 .378 .354	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722 .765 .596 .209 157 321	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354 .333 .354 .378 .378 .378 .408
6 7 Series P <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	188 Pair: Bulgaria with E Cross Correlation 437 475 269 .039 .091 .192 .445 .670 .775 .602 .177 .103 277 302	.500 U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .354 .378 .378 .408 .447	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	Pair: Croatia with EU Cross Correlation 432 459 288 013 .138 .205 .410 .722 .765 .596 .209 157 321 286	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354 .332 .316 .333 .354 .378 .408 .408 .447

Tables 2. 28 Poverty rates's cross correlations (each Member State vs EU)

Series Par	ir: Cyprus with EU Cross	ſ	Series Pa	ir: Czech with EU Cross	
Lag	Correlation	Std. Error	Lag	Correlation	Std. Error
-7	.433	.500	-7	392	.500
-6	.489	.447	-6	394	.447
-5	.228	.408	-5	287	.408
-4	066	.378	-4	146	.378
-3	177	.354	-3	.059	.354
-2	277	.333	-2	.254	.333
-1	259	.316	-1	.534	.316
0	445	.302	0	.875	.302
1	680	.316	1	.726	.316
2	622	.333	2	.426	.333
3	353	.354	3	.113	.354
4	.011	.378	4	188	.378
5	.285	.408	5	331	.408
б	.327	.447	6	301	.447
7	.201	.500	7	247	.500
Series Pa	ir: Denmark with E Cross	EU	Series F	Pair: Estonia with E Cross	U
Series Par Lag	ir: Denmark with E Cross Correlation	EU Std. Error	Series F Lag	Pair: Estonia with E Cross Correlation	U Std. Error
Series Pa Lag -7	ir: Denmark with E Cross Correlation 370	EU Std. Error .500	Series F Lag -7	Pair: Estonia with E Cross Correlation .414	U Std. Error .500
Series Pa Lag -7 -6	ir: Denmark with E Cross Correlation 370 351	EU Std. Error .500 .447	Series F Lag -7 -6	Pair: Estonia with E Cross Correlation .414 .469	U Std. Error .500 .447
Series Pa Lag -7 -6 -5	ir: Denmark with E Cross Correlation 351 327	EU Std. Error .500 .447 .408	Series F Lag -7 -6 -5	Pair: Estonia with E Cross Correlation .414 .469 .247	U Std. Error .500 .447 .408
Series Pa Lag -7 -6 -5 -4	ir: Denmark with E Cross Correlation 370 351 327 169	EU Std. Error .500 .447 .408 .378	Series F Lag -7 -6 -5 -4	Pair: Estonia with E Cross Correlation .414 .469 .247 .151	U Std. Error .500 .447 .408 .378
Series Pa Lag -7 -6 -5 -4 -3	ir: Denmark with E Cross Correlation 370 351 327 169 .070	EU Std. Error .500 .447 .408 .378 .354	Series F Lag -7 -6 -5 -4 -3	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173	U Std. Error .500 .447 .408 .378 .354
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406	EU Std. Error .500 .447 .408 .378 .354 .333	Series F Lag -7 -6 -5 -4 -3 -2	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 .165	U Std. Error .500 .447 .408 .378 .354 .333
Series Pa Lag -7 -6 -5 -4 -3 -2 -1	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316	Series F Lag -7 -6 -5 -4 -3 -2 -1	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 173 165 299	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606	EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series F Lag -7 -6 -5 -4 -3 -2 -1 0	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 165 .299 381	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 165 299 381 640	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 .165 .299 .381 .640 .673	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293 .122	EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .354	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 .165 .299 381 640 673 270	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .354
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293 .122 .071	EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .333 .354 .333	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 165 .299 381 640 673 270 .007	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293 .122 .071 283	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354 .378 .316 .333 .354 .378 .408	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 165 299 381 640 673 270 .007 .237	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378 .408
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293 .122 .071 283 372	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354 .378 .408 .408 .447	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 165 .299 381 640 673 270 .007 .237 .266	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378 .408 .447
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Denmark with E Cross Correlation 370 351 327 169 .070 .406 .698 .606 .438 .293 .122 .071 283 372 232	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500	Series F Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	Pair: Estonia with E Cross Correlation .414 .469 .247 .151 .173 .165 .299 381 .640 .673 .270 .007 .237 .266 .251	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .335 .354 .378 .408 .447 .500

ŒCONOMICA

Carles De	Cross Correlatio	ons	C	Cross Correlatio	ons
Series Pa	ir: Finland with EU	J	Series Pa	air: France with EU	
Laσ	Correlation	Std Frror	Ιασ	Correlation	Std Error
-7	- 291	500	-7	- 433	500
-6	- 317	447	-6	- 481	447
-5	- 204	408	-5	- 226	408
-4	047	.378	-4	.035	.378
-3	.246	.354	-3	.154	.354
-2	.222	.333	-2	.225	.333
-1	.059	.316	-1	.292	.316
0	.404	.302	0	.582	.302
1	.477	.316	1	.727	.316
2	.447	.333	2	.614	.333
3	.343	.354	3	.293	.354
4	140	.378	4	090	.378
5	315	.408	5	273	.408
6	175	.447	6	320	.447
7	049	.500	7	214	.500
Sorias Do	in Compony with I	711	Somias De	in Crasse with EU	r
Series Pa	ir: Germany with E	EU	Series Pa	air: Greece with EU	ſ
Series Pa	ir: Germany with E Cross Correlation	EU Std. Error	Series Pa	air: Greece with EU Cross Correlation	Std. Error
Series Pa Lag -7	ir: Germany with E Cross Correlation .218	EU Std. Error .500	Series Pa	air: Greece with EU Cross Correlation .431	Std. Error
Series Pa Lag -7 -6	ir: Germany with F Cross Correlation .218 .286	EU Std. Error .500 .447	Series Pa Lag -7 -6	air: Greece with EU Cross Correlation .431 .485	Std. Error .500 .447
Series Pa Lag -7 -6 -5	ir: Germany with E Cross Correlation .218 .286 .027	EU Std. Error .500 .447 .408	Series Pa Lag -7 -6 -5	air: Greece with EU Cross Correlation .431 .485 .252	Std. Error .500 .447 .408
Series Pa Lag -7 -6 -5 -4	ir: Germany with E Cross Correlation .218 .286 .027 358	EU Std. Error .500 .447 .408 .378	Series Pa Lag -7 -6 -5 -4	air: Greece with EU Cross Correlation .431 .485 .252 098	Std. Error .500 .447 .408 .378
Series Pa Lag -7 -6 -5 -4 -3	ir: Germany with F Cross Correlation .218 .286 .027 358 211	EU <u>Std. Error</u> <u>.500</u> .447 .408 .378 .354	Series Pa Lag -7 -6 -5 -4 -3	air: Greece with EU Cross Correlation .431 .485 .252 098 233	Std. Error .500 .447 .408 .378 .354
Series Pa Lag -7 -6 -5 -4 -3 -2	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195	EU Std. Error .500 .447 .408 .378 .354 .333	Series Pa Lag -7 -6 -5 -4 -3 -2	air: Greece with EU Cross Correlation .431 .485 .252 .098 233 282	Std. Error .500 .447 .408 .378 .354 .333
Series Pa Lag -7 -6 -5 -4 -3 -2 -1	ir: Germany with F Cross Correlation .218 .286 .027 358 211 .195 .230	EU Std. Error .500 .447 .408 .378 .354 .333 .316	Series Pa Lag -7 -6 -5 -4 -3 -2 -1	air: Greece with EU Cross Correlation .431 .485 .252 .098 .233 .282 .282 .265	Std. Error .500 .447 .408 .378 .354 .333 .316
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	air: Greece with EU Cross Correlation .431 .485 .252 .098 .233 .282 .282 .265 .337	Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	air: Greece with EU Cross Correlation .431 .485 .252 .098 .233 .282 .282 .265 .337 .585	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 644	EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	hir: Greece with EU Cross Correlation .431 .485 .252 .098 233 282 265 337 585 652	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 644 232	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .316 .333 .354	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	hir: Greece with EU Cross Correlation .431 .485 .252 .098 233 .282 .282 .265 .337 .585 .652 .377	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .316 .333 .354
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 644 232 .090	EU Std. Error .500 .447 .408 .378 .354 .354 .316 .302 .316 .302 .316 .333 .354 .354 .378	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	air: Greece with EU Cross Correlation .431 .485 .252 .098 233 282 .282 .265 337 .585 652 377 043	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 644 232 .090 .037	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .354 .378 .354 .378 .378 .302 .316 .333 .354 .378 .354 .378	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	air: Greece with EU Cross Correlation .431 .485 .252 .098 .233 .282 .265 .337 .585 .652 .377 .043 .275	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354 .378 .378 .378 .408
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Germany with E Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 644 232 .090 .037 .007	EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .316 .335 .354 .378 .408 .408 .447	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	hir: Greece with EU Cross Correlation .431 .485 .252 .098 233 282 .265 337 .585 652 377 .043 .275 .320	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354 .378 .408 .447
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Germany with F Cross Correlation .218 .286 .027 358 211 .195 .230 .026 390 .026 390 .026 390 .026 390 .026 390 .026 390 .026 390 037 .007 .007 .109	EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 	Air: Greece with EU Cross Correlation .431 .485 .252 .098 233 .282 265 337 .585 652 377 .043 .275 .320 .191	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354 .378 .408 .447 .500

	ir: Hungary with E	U	Series P	air: Ireland with EU	
Las	Cross	Ctd Emen	Lan	Cross	Std Emen
	Correlation	Slu. Error		Correlation	Std. Error
-1	338	.500	-1	392	.500
-0	323	.447	-0	389	.447
-5	251	.408	-5	280	.408
-4	206	.378	-4	130	.378
-3	107	.354	-3	013	.354
-2	.236	.333	-2	.222	.333
-1	.701	.316	-1	.610	.316
0	.954	.302	0	.919	.302
1	.685	.316	1	.765	.316
2	.227	.333	2	.385	.333
3	089	.354	3	.016	.354
4	166	.378	4	187	.378
5	246	.408	5	296	.408
6	308	.447	6	299	.447
7	298	.500	7	298	.500
0 ' D	· • • • • • • •				
Series Pa	Ir: Italy with EU		Series P	air: Latvia with EU Cross	
Series Pa	Cross Correlation	Std. Error	Series P Lag	air: Latvia with EU Cross Correlation	Std. Error
Lag -7	Cross Correlation .420	Std. Error	Series P Lag -7	air: Latvia with EU Cross Correlation 448	Std. Error
Lag -7 -6	Ir: Italy with EU Cross Correlation .420 .426	Std. Error .500 .447	Series P Lag -7 -6	air: Latvia with EU Cross Correlation 448 478	Std. Error .500 .447
Lag -7 -6 -5	Ir: Italy with EU Cross Correlation .420 .426 .243	Std. Error .500 .447 .408	Series P Lag -7 -6 -5	air: Latvia with EU Cross Correlation 448 478 292	Std. Error .500 .447 .408
Lag -7 -6 -5 -4	Ir: Italy with EU Cross Correlation .420 .426 .243 028	Std. Error .500 .447 .408 .378	Series P <u>Lag</u> -7 -6 -5 -4	air: Latvia with EU Cross Correlation 448 478 292 016	Std. Error .500 .447 .408 .378
Lag -7 -6 -5 -4 -3	III: Italy with EU Cross Correlation .420 .426 .243 028 235	Std. Error .500 .447 .408 .378 .354	Series P Lag -7 -6 -5 -4 -3	air: Latvia with EU Cross Correlation 448 478 292 016 .134	Std. Error .500 .447 .408 .378 .354
Lag -7 -6 -5 -4 -3 -2	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388	Std. Error .500 .447 .408 .378 .354 .333	Series P Lag -7 -6 -5 -4 -3 -2	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285	Std. Error .500 .447 .408 .378 .354 .333
Lag -7 -6 -5 -4 -3 -2 -1	III: Italy with EU Cross Correlation .420 .426 .243 .028 235 388 376	Std. Error .500 .447 .408 .378 .354 .333 .316	Series P Lag -7 -6 -5 -4 -3 -2 -1	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446	Std. Error .500 .447 .408 .378 .354 .354 .333 .316
Lag -7 -6 -5 -4 -3 -2 -1 0	III: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 276	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series P Lag -7 -6 -5 -4 -3 -2 -1 0	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662	Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302
Lag -7 -6 -5 -4 -3 -2 -1 0 1	III: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 276 395	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741	Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 276 395 483	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741 .577	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 376 395 483 332	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741 .577 .245	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .354
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 376 395 483 332 160	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741 .577 .245 078	Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .354 .354 .378
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	III: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 376 395 483 332 160 260	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .316 .333 .354	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	air: Latvia with EU Cross Correlation 448 478 292 016 .134 2.85 .446 .662 .741 .577 .245 078 329	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .354 .378 .378 .378 .378 .378 .408
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 376 276 395 483 332 160 .260	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .316 .333 .354 .378 .408 .447	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741 .577 .245 078 329 330	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .354 .333 .354 .378 .408 .447
Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	IIT: Italy with EU Cross Correlation .420 .426 .243 028 235 388 376 376 276 395 483 320 160 .260 .360 .160	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .316 .333 .316 .333 .354 .354 .354 .378 .408 .447 .500	Series P Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	air: Latvia with EU Cross Correlation 448 478 292 016 .134 .285 .446 .662 .741 .577 .245 078 329 330 256	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500

ŒCONOMICA

Series Pa	ir: Lithuania with I	EU	Series Pa	air: Luxembourg wi	th EU
T	Cross	Ct 1 Ennen	т	Cross	Ct 1 Ennen
	Correlation	Slu. Effor		Correlation	Slu. Error
-1	423	.300	-1	.445	.300
-0	404	.447	-0	.403	.447
-5	255	.408	-5	.293	.408
-4	.144	.370	-4	030	.370
-5	.101	.334	-3	242	.334
-2	.145	.555	-2	294	.333
-1	.203	.310	-1	331	.510
0	.437	.302	0	463	.302
$\frac{1}{2}$./21	.510	1	030	.510
2	.090	.555	2	010	.555
3	.274	.334	3	340	.334
4	004	.3/8	4	.028	.3/8
5	248	.408	5	.349	.408
6	263	.447	6	.296	.447
7	253	.500	/	.200	.500
Series Pa	ir: Malta with EU		Series Pa	air: Netherlands wit	h EU
Series Pa	ir: Malta with EU Cross		Series Pa	ir: Netherlands wit Cross	h EU
Series Pa Lag	ir: Malta with EU Cross Correlation	Std. Error	Series Pa	ir: Netherlands wit Cross Correlation	h EU Std. Error
Series Pa Lag -7	ir: Malta with EU Cross Correlation 012	Std. Error .500	Series Pa Lag -7	ir: Netherlands wit Cross Correlation .442	h EU Std. Error .500
Series Pa Lag -7 -6	ir: Malta with EU Cross Correlation 012 040	Std. Error .500 .447	Series Pa Lag -7 -6	ir: Netherlands wit Cross Correlation .442 .477	h EU Std. Error .500 .447
Series Pa Lag -7 -6 -5	ir: Malta with EU Cross Correlation 012 040 322	Std. Error .500 .447 .408	Series Pa Lag -7 -6 -5	ir: Netherlands wit Cross Correlation .442 .477 .284	h EU Std. Error .500 .447 .408
Series Pa <u>Lag</u> -7 -6 -5 -4	ir: Malta with EU Cross Correlation 012 040 322 484	Std. Error .500 .447 .408 .378	Series Pa Lag -7 -6 -5 -4	ir: Netherlands wit Cross Correlation .442 .477 .284 025	h EU Std. Error .500 .447 .408 .378
Series Pa <u>Lag</u> -7 -6 -5 -4 -3	ir: Malta with EU Cross Correlation 012 040 322 484 236	Std. Error .500 .447 .408 .378 .354	Series Pa <u>Lag</u> -7 -6 -5 -4 -3	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144	h EU Std. Error .500 .447 .408 .378 .354
Series Pa <u>Lag</u> <u>-7</u> <u>-6</u> <u>-5</u> <u>-4</u> <u>-3</u> <u>-2</u>	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273	Std. Error .500 .447 .408 .378 .354 .333	Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198	h EU Std. Error .500 .447 .408 .378 .354 .333
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779	Std. Error .500 .447 .408 .378 .354 .333 .316	Series Pa Lag -7 -6 -5 -4 -3 -2 -1	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448	h EU Std. Error .500 .447 .408 .378 .354 .333 .316
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448 652	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800 .250	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448 652 709	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800 .250 165	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448 652 709 614	h EU Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800 .250 165 200	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448 652 709 614 194	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .354
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Malta with EU Cross Correlation 012 040 322 484 236 2.73 .779 .800 .250 165 200 161	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .378	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Netherlands wit Cross Correlation .442 .477 .284 025 .144 198 448 652 709 614 194 094	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .316 .333 .354 .354 .378
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .273 .779 .800 .250 165 200 161 192	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378 .378 .408	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 .198 448 652 709 614 194 .094 .264	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .333 .354 .378 .378 .378 .378 .302 .316 .378
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800 .250 165 200 161 192 188	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .378 .378 .408 .447	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 .198 448 652 .709 614 .194 .094 .264 .314	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .354 .378 .354 .378 .354 .378 .354 .378 .354 .378 .354 .378 .340 .340 .340 .340 .340 .340 .340 .340 .340 .340 .354 .355 .354 .355 .354 .355 .356 .356 .357 .356 .356 .357 .356 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .356 .357 .357 .356 .357 .357 .357 .357 .357 .357 .357 .357 .357 .357 .357 .357 .357 .408 .447
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Malta with EU Cross Correlation 012 040 322 484 236 .273 .779 .800 .250 165 200 161 192 188 166	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Netherlands wit Cross Correlation .442 .477 .284 025 144 198 448 652 709 614 .194 .094 .264 .314 .269	h EU Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500

Series Pa	ir: Poland with EU		Series Pa	air: Portugal with E	U
	Cross			Cross	
Lag	Correlation	Std. Error	Lag	Correlation	Std. Error
-7	453	.500	-7	.282	.500
-6	477	.447	-6	.362	.447
-5	293	.408	-5	.073	.408
-4	029	.378	-4	289	.378
-3	.131	.354	-3	223	.354
-2	.293	.333	-2	.052	.333
-1	.496	.316	-1	.229	.316
0	.683	.302	0	086	.302
1	.711	.316	1	558	.316
2	.559	.333	2	687	.333
3	.222	.354	3	364	.354
4	063	.378	4	.107	.378
5	312	.408	5	.159	.408
6	351	.447	6	.078	.447
7	261	.500	7	.104	.500
Series Pa	ir: Romania with E	U	Series Pa	air: Slovakia with E	U
Series Pa	ir: Romania with E Cross Correlation	Std Error	Series Pa	air: Slovakia with E Cross Correlation	U Std. Error
Series Pa	ir: Romania with E Cross Correlation - 406	U Std. Error 500	Series Pa	air: Slovakia with E Cross Correlation - 446	U Std. Error 500
Series Pa Lag -7 -6	ir: Romania with E Cross Correlation 406 - 438	CU Std. Error .500 447	Series Pa Lag -7 -6	air: Slovakia with E Cross Correlation 446 - 482	U Std. Error .500 447
Series Pa Lag -7 -6 -5	ir: Romania with E Cross Correlation 406 438 215	2U <u>Std. Error</u> .500 .447 .408	Series Pa <u>Lag</u> <u>-7</u> <u>-6</u> <u>-5</u>	air: Slovakia with E Cross Correlation 446 482 275	U Std. Error .500 .447 .408
Series Pa <u>Lag</u> <u>-7</u> <u>-6</u> <u>-5</u> <u>-4</u>	ir: Romania with E Cross Correlation 406 438 215 047	Std. Error .500 .447 .408 .378	Series Pa Lag -7 -6 -5 -4	air: Slovakia with E Cross Correlation 446 482 275 .027	U <u>Std. Error</u> .500 .447 .408 .378
Series Pa <u>Lag</u> -7 -6 -5 -4 -3	ir: Romania with E Cross Correlation 406 438 215 047 015	Std. Error .500 .447 .408 .378 .354	Series Pa Lag -7 -6 -5 -4 -3	air: Slovakia with E Cross Correlation 446 482 275 .027 .117	U Std. Error .500 .447 .408 .378 .354
Series Pa <u>Lag</u> <u>-7</u> <u>-6</u> <u>-5</u> <u>-4</u> <u>-3</u> <u>-2</u>	ir: Romania with E Cross Correlation 406 438 215 047 015 .180	Std. Error .500 .447 .408 .378 .354 .333	Series Pa Lag -7 -6 -5 -4 -3 -2	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216	U <u>Std. Error</u> .500 .447 .408 .378 .354 .333
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520	Std. Error .500 .447 .408 .378 .354 .333 .316	Series Pa Lag -7 -6 -5 -4 -3 -2 -1	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316
Series Pa <u>Lag</u> <u>-7</u> <u>-6</u> <u>-5</u> <u>-4</u> <u>-3</u> <u>-2</u> <u>-1</u> 0	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813 .771	Std. Error .500 .447 .408 .378 .354 .333 .316 .302	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Romania with F Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612	U <u>Std. Error</u> .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466 .063	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .354	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612 .211	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .302 .316 .333 .354
Series Pa -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466 .063 138	Std. Error .500 .447 .408 .378 .354 .333 .316 .333 .316 .333 .316 .333 .316 .333 .316 .333 .354	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612 .211 096	U Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .316 .333 .354 .354 .378
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466 .063 138 210	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .332 .316 .333 .316 .378 .378 .408	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612 .211 096 292	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .354 .378 .378 .408
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Romania with E Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466 .063 138 210 337	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .332 .316 .333 .316 .333 .316 .333 .316 .333 .354 .378 .408 .447	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612 .211 096 292 314	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .408 .447
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Romania with F Cross Correlation 406 438 215 047 015 .180 .520 .813 .771 .466 .063 138 210 337 296	Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500	Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	air: Slovakia with E Cross Correlation 446 482 275 .027 .117 .216 .433 .664 .765 .612 .211 096 292 314 278	U Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .354 .378 .354 .378 .354 .378 .302 .316 .302 .316 .333 .354 .354 .355 .356 .302 .316 .355 .35

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Series Pa	ir: Slovenia with E	U	Series Pa	ir: Spain with EU	
	Cross			Cross	
Lag	Correlation	Std. Error	Lag	Correlation	Std. Error
-7	.009	.500	-7	.440	.500
-6	.085	.447	-6	.488	.447
-5	077	.408	-5	.204	.408
-4	362	.378	-4	160	.378
-3	227	.354	-3	144	.354
-2	.190	.333	-2	158	.333
-1	.558	.316	-1	275	.316
0	.661	.302	0	448	.302
1	.075	.316	1	720	.316
2	461	.333	2	660	.333
3	389	.354	3	249	.354
4	169	.378	4	.035	.378
5	081	.408	5	.231	.408
6	073	.447	6	.279	.447
7	084	.500	7	.261	.500
Series Pa	ir: Sweden with EU	J			
Series Pa	ir: Sweden with EU Cross	J			
Series Pa	ir: Sweden with EU Cross Correlation	J Std. Error			
Series Pa Lag -7	ir: Sweden with EU Cross Correlation .357	J Std. Error .500			
Series Pa Lag -7 -6	ir: Sweden with EU Cross Correlation .357 .388	J Std. Error .500 .447			
Series Pa Lag -7 -6 -5	ir: Sweden with EU Cross Correlation .357 .388 .145	J Std. Error .500 .447 .408			
Series Pa <u>Lag</u> -7 -6 -5 -4	ir: Sweden with EU Cross Correlation .357 .388 .145 035	J Std. Error .500 .447 .408 .378			
Series Pa <u>Lag</u> -7 -6 -5 -4 -3	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084	J Std. Error .500 .447 .408 .378 .354			
Series Pa <u>Lag</u> -7 -6 -5 -4 -3 -2	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123	J <u>Std. Error</u> .500 .447 .408 .378 .354 .333			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361	J Std. Error .500 .447 .408 .378 .354 .354 .333 .316			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511	J Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503	J Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485	J Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .333			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485 140	J Std. Error .500 .447 .408 .378 .354 .354 .333 .316 .302 .316 .333 .354			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485 140 .023	J Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .333			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485 140 .023 .098	J Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .378 .408			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485 140 .023 .098 .322	J Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .354 .354 .378 .354 .378 .408 .447			
Series Pa Lag -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7	ir: Sweden with EU Cross Correlation .357 .388 .145 035 084 123 361 511 503 485 140 .023 .098 .322 .205	J Std. Error .500 .447 .408 .378 .354 .333 .316 .302 .316 .302 .316 .333 .316 .333 .354 .378 .408 .447 .500			

According to data from the above tables, the lag's trend between confidence limits for each Member State vs EU average (related to the analysed period) is presented in Figure 6.



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Figure 6. Lag's trend between confidence limits (each Member State vs EU)

Source: Authors' contribution using SPSS software

Cyprus, Estonia, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain and Sweden are better correlated to the EU average's trend related to the poverty rate, especially during the forecasted period.

On the other hand, Austria, Bulgaria, Malta and Romania will face to lower correlation of the indicator to EU average.

6. Conclusion

Poverty is not a solved challenge for the EU in 2018. There are enough Member States to risk of poverty and social exclusion rates greater than 25% of total population.

The regional disparities related to this indicator are high across the EU. The Northern Member States have better situation than those from South and South-East.

The poverty rate is directly connected to the economic development. The economic development is the key element in defining and implementing the European social policy.

States as Greece, Bulgaria, Romania, Spain and Croatia will face with high poverty rates at least on short and medium terms.

In this context, a future research regarding the EU multi- speeds socio-economic development and poverty will be very usefully.

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