CHANGES IN THE FOREIGN TRADE OF ROMANIAN REGIONS – A SHIFT-SHARE ANALYSIS [1]

Senior Researcher **Mihaela-Nona CHILIAN**
Institute for Economic Forecasting, Bucharest, Romania
cnona@ipe.ro
Senior Researcher **Marioara IORDAN**
Institute for Economic Forecasting, Bucharest, Romania
miordan@ipe.ro

Abstract:
The paper aims to assess the evolution of exports (overall and by sectors) in the regions of Romania. Considering the fact that the export base of a region acts more as an absolute advantage for the regional development, we use shift-share analysis tools to investigate the extent of the interregional trends and disparities in exports. The results reveal a diverse sectoral milieu and a trend towards higher diversification, better use of regional resources and technological upgrading, also providing useful insights for the general and specifically-targeted policy areas concerning regional development and business environment.

Key words: Romanian regions, shift-share analysis, regional foreign trade analysis, regional competitiveness

JEL classification: R11, R12, R15

1. INTRODUCTION

As shown in the economic literature, regional competitiveness also involves an *external dimension* (Iordan *et al*., 2013), which may be analyzed starting from the theory of comparative advantage (Chilian, 2011). Practically, one may analyze the „territorial allocation" of comparative and competitive advantages and disadvantages of product groups and subgroups (and, implicitly, of economic sectors/industries). This means, among others, to find answers to issues such as (Chilian, 2013):

Which are the regions/counties with the highest shares in the overall exports of Romania?

Which are the products/groups of products/sectors in which these regions/counties are export specialized (if they are)?

What was the impact of the post-2008 crisis period in the regions/counties in what regards their competitive position in foreign trade?

Which might be the structural sectoral adjustments induced by the 2008 crisis in the regions/counties and their likely impacts if the economic crisis/recession returns?

The „*export basis*" of a region is a key factor of its prosperity, and its decline or a worsening of trade balance would mean a decline in the region's competitiveness. Competition among the regions (both intra- and inter-country) may push a region out from a sector where it might have had established a comparative advantage, or a region from a sector where it might have had maintained its previous comparative advantage (Gardiner *et al*., 2004).

Considering the comparative advantage theory at regional level, we must mention here the important arguments brought by Camagni (2002), according to whom the cities, regions and other locations compete rather on the basis of *absolute advantage* than on the basis of comparative advantage, and the efficient mechanisms of automated adjustment available at macroeconomic level, such as the price and wage flexibility and the exchange rate, cannot be applied at territorial level. The factor endowment, the attractiveness for investors and labor, the policies enforced at territorial levels, together with the very efficient penalty mechanism of inter-regional capital and labor migration (which once fleeing from a region are very hard to be replaced) may turn a region into a successful one, able to provide a more than decent living standard for its citizens, or into a

"relatively bankrupt" one, when the efficiency of all its sectors is lower than that of the other regions, which translates into decline and long-term exclusion (Camagni, 2002).

On another side, the economic structure plays a very important part in the dynamics of sub-national development gaps, because it impacts on the incomes and their regional distribution. Empirical studies revealed that areas with sustainable manufacturing industry and high employment in services enjoyed higher welfare, and the households' incomes were higher and poverty rates lower, while the mining and agricultural areas, where wages were usually lower and employment was fluctuating, registered higher poverty rates.

Considering both these issues, the paper attempts, by the means of *export shift-share analysis*, to discover which are the Romanian regions that register dynamics of economic structures conducive to high external competitiveness (and, thus, to a higher integration into the single market) and to sustainable specializations, adequate to the requirements of building a modern, highly flexible economy, with a high technological level.

2. METHODOLOGICAL ISSUES

The shift-share analysis is frequently used in order to get a picture of the key factors of regional economic growth, and it may approach different issues, such as output growth, employment and productivity growth, export and import dynamics, etc (Fernández Vázquez *et al*., 2005). The level of such indicators and their changes may be key factors of the analysis of economic and social performance at regional and sub-regional levels (D'Elia, 2005, Chilian, 2012). In its "standard" shape, such an analysis aims at "dividing" the dynamics of a certain growth factor from a certain region into three components:

i) A *national* component, showing how much a variable from each sector and region would have changed if it had experienced the average overall growth rate at the national level (or EU rate, in the case of a broader analysis),

ii) A *sectoral* component (also called sectoral mix), showing the state of the variables if each of the analyzed sectors would have experienced the same growth rate as at the national level, minus the previous overall component, and

iii) A *shift* component (also called regional change or competitive effect), which stems from the difference between the effectively observed dynamics and the computed dynamics in relation to the national dynamics, which captures those dynamic elements that are unique for each region. This component may be interpreted as the overall result of a balance between the "attractiveness" and the "rejection" of a region for different sectors of activity (Leo and Philippe, 2005).

By the means of the standard tools of shift-share analysis, the paper attempts to assess the sectoral development gaps and the external competitiveness of the Romanian regions, but not from the perspective of value added or employment in the main economic sectors, but from that of *regional foreign trade* and, more specifically, of ***regional exports***. Our analysis attempts to answer questions such as (see D'Elia, 2005):

- *To what extent the change in the export structure by the main product groups of a region in a certain period was determined by the overall changes in the Romanian economy during the same period, reflected by the overall export dynamics*?
- *How much the change in the export structure by the main product groups of a region in a certain period was determined by the change in the structure by the main product groups of the overall exports during the same period?*
- *How much the change in the export structure by the main product groups of a region in a certain period was firstly determined by the changes in the overall economy of a region, during the same period?*

Due to data availability, the shift-share analysis of the regional export dynamics refers to the 2005-2013 period, and the considered export sectoral structure is that of the main product groups included in the Combined Nomenclature (CN) classification.

A starting point for the shift-share analysis is the following equation:

$$\text{Total change} = NS + IM + RS \quad (1)$$

where: NS is the *national effect* (national shares of the main product groups as according to the CN), IM is the *sectoral effect* (sectoral mix effect) and RS is the *regional effect*. The computation formulas for the three components for each sector are the following (D'Elia, 2005; Chilian, 2012):

1. *National share of exports by the main product groups (national effect):*

$$NS = NI^s_{t-1} * [(RO_t/RO_{t-1} - 1)] \quad (2)$$

where: s refers to each product group [2] and t and t-1 refer to the beginning and the end of the period, respectively, and NI refers to the exports from a certain region as compared to the national exports.

Thus, the national share by product groups is the export volume of a certain region (mil. Lei or Euro), by product groups, at the beginning of the period, multiplied by the overall exports growth rate in the same period. This reveals how much the export from each product group and region would have changed if it had the same dynamics as the national exports.

2. *Sectoral mix (sectoral effect)*

$$IM = NI^s_{t-1} * [((RO^s_t/RO^s_{t-1}) - 1) - ((RO_t/RO_{t-1}) - 1)] \quad (3)$$

The sectoral mix component measures the influence of a mix of product groups with fast/slow growth from a certain region, as compared to the national exports, minus other overall effects at national level. A product group with a share in the total exports of a certain region higher than in the national exports will have a positive sectoral mix if the national level of the exports of the analyzed product group increased faster that the national total exports. On the contrary, if a product group is under-represented in the exports of a certain region (as compared to its national share), it has a negative structural or sectoral mix.

3. *Regional shift (regional or competitive effect):*

$$RS = NI^s_{t-1} * [((NI^s_t/NI^s_{t-1}) - 1) - ((RO^s_t/RO^s_{t-1}) - 1)] \quad (4)$$

The regional shift reveals the *competitive* change in a region, namely the unique dynamic factors which determine its export performance.

This indicator shows the export leading and laggard regions and product groups, as compared to the national levels. The regional shift factor can be further divided into a *regional comparative advantage component* (ACR) and an *allocation component* (CA). Such decomposition is important at sub-regional level for each existing scale effect if the regions vary largely in size (D'Elia, 2005; Esteban-Marquillas, 2000; Baxendine *et al*, 2005).

$$ACR = NI_{t-1} * (RO^s_t/RO_{t-1}) * [(NI^s_t/NI^s_{t-1} - 1) - (RO^s_t/RO^s_{t-1}) - 1] \quad (5)$$

$$CA = [NI^s_{t-1} - NI_{t-1} * (RO^s_t/RO^s_{t-1})] * [(NI^s_t/NI^s_{t-1} - 1) - (RO^s_t/RO^s_{t-1}) - 1] \quad (6)$$

The comparative advantage component reveals the competitiveness of each product group from a region as compared to its national competitiveness, and the allocation component is a residual element which combines the relative share of a product group from a region as compared to its national share with the growth rate of the product group in the national and regional exports.

3. CHANGES IN THE REGIONAL EXPORT STRUCTURE

The dynamics of the ***total exports*** of the Romanian regions over the period 2005-2013 reveals two relatively distinct sub-periods: 2005-2008 (pre-crisis) and 2009-2013 (crisis and post-crisis), with a sharp decline in 2009 and a partial one in 2012 (Figure 1). In the case of most main product groups, one may also see the years 2009 and 2012 as inflection points in the regional export dynamics, but with certain regional and/or sectoral peculiarities [3]. In such a context, we analyzed

by the means of shift-share analysis the *changes in the export structure* for the entire analyzed period (year 2013 as against year 2005), but also for the two distinct sub-periods revealed in the total national and regional exports dynamics, namely 2005-2008 and 2009-2013.

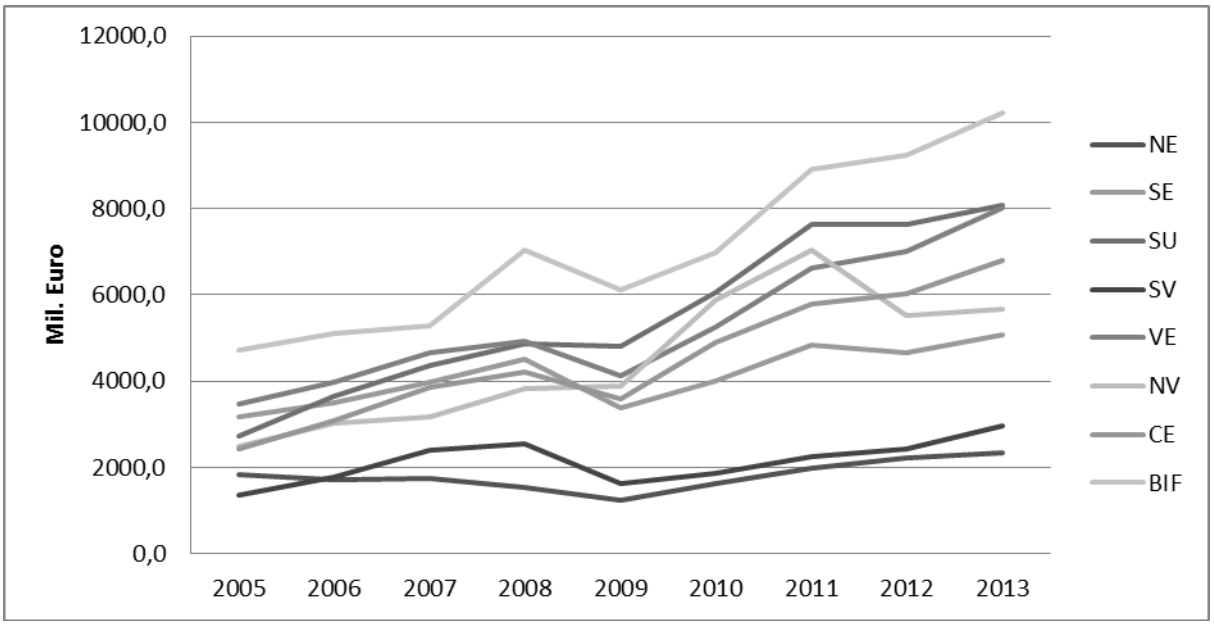

Figure 1. Evolution of total Romanian regional exports

Source: Authors' computations, based on data from the National Institute of Statistics and TEMPO-on line.

Table 1 presents the total change in the regional exports in Romania in the analyzed periods, expressed as percentage of the 2005 export levels, and 2009 export levels, respectively. As one may see, there is no product group for which all the regions have experienced negative changes as compared to the 2005 export levels, but there are some *product groups* for which several regions recorded such changes, different or not by sub-periods: III (Nord-Est, Sud-Est, Sud-Vest Oltenia), V (Nord-Est, Sud-Vest Oltenia, Nord-Vest, Bucureşti-Ilfov), VIII (Nord-Est, Sud Muntenia, Nord-Vest), X (Nord-Est, Sud-Est, Sud-Vest Oltenia, Bucureşti-Ilfov), XI (Nord-Est, Sud-Est, Sud Muntenia, Vest, Nord-Vest, Bucureşti-Ilfov), XII (Nord-Est, Sud Muntenia, Nord-Vest, Centru, Bucureşti-Ilfov), XIII (Nord-Est, Sud-Vest Oltenia, Bucureşti-Ilfov), XX (Nord-Est, Sud-Vest Oltenia, Bucureşti-Ilfov).

Table 1. Total change in the Romanian regional exports, in % of 2005 export levels, and 2009 export levels, respectively, by main CN product groups

	Nord-Est			**Sud-Est**			**Sud Muntenia**			**Sud-Vest Oltenia**		
	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013
I	1128.8	54.0	421.3	420.0	-13.5	336.7	374.9	101.5	79.8	735.8	208.7	635.0
II	55.4	540.9	-50.5	2053.5	540.9	295.2	1196.8	540.9	62.1	1300.6	540.9	489.7
III	-56.4	-77.3	-34.9	808.5	-85.6	952.2	78.5	91.7	30.4	28300.0	1303400.0	-86.3
IV	154.2	96.6	169.3	531.4	104.3	62.9	1821.4	575.4	132.5	5984.0	3832.6	-0.2
V	-99.1	-89.3	220.7	122.9	106.9	75.9	31.0	36.5	46.5	-92.8	-35.8	-27.6
VI	41.5	53.5	35.1	12.2	-68.0	759.8	-20.3	-51.8	100.4	-32.0	71.8	-8.5
VII	294.0	87.8	161.1	177.0	190.3	32.2	264.5	36.9	196.5	151.3	139.7	51.5
VIII	-6.8	-34.8	173.5	192.6	-23.8	564.8	-13.3	-67.2	-12.3	1592.5	1205.8	61.4
IX	195.3	-20.8	191.5	71.8	14.4	46.9	53.6	-19.1	107.9	-6.3	27.6	28.3
X	52.1	-33.5	191.9	146.8	-23.3	221.2	244.0	61.8	89.8	-5.8	141.6	22.6
XI	6.1	-11.6	37.2	2.3	-18.8	59.7	-16.5	-14.9	32.6	41.5	41.1	14.2
XII	-37.2	-26.6	21.8	53.9	57.8	-0.6	-63.6	-60.4	63.5	39.2	15.9	52.0

XIII	-32.4	-11.6	29.6	200.7	69.8	10.8	184.5	189.4	35.6	-50.7	-42.2	79.1
XV	-4.3	-0.8	104.5	-37.2	19.6	6.2	87.3	43.8	99.3	8.0	25.6	52.4
XVI	307.2	46.6	201.9	204.7	168.4	12.9	164.0	116.7	44.2	284.4	163.1	151.0
XVII	360.5	116.1	75.9	164.8	81.7	11.9	741.5	240.7	75.8	896.1	430.5	146.4
XVIII	74.2	-11.1	133.3	222.4	407.1	11.9	2011.2	709.0	268.3	107.7	-41.1	252.8
XX	-21.1	-14.1	2.7	-23.1	-35.2	51.1	546.8	145.4	137.8	-7.6	-26.1	43.0
XXII	663.3	186.1	20.0	7183.7	127.8	3344.1	-73.8	-79.6	83.8	873.3	-71.0	473.1
	Vest			**Nord-Vest**			**Centru**			**Bucureşti-Ilfov**		
	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013	2005-2013	2005-2008	2009-2013
I	112.0	12.9	131.5	270.3	42.9	193.4	309.5	38.9	185.0	178.6	-36.7	197.9
II	416.1	540.9	152.8	213.7	540.9	226.7	416.8	540.9	216.1	1056.4	540.9	155.0
III	535.5	224.9	390.1	2616.5	783.0	381.5	129900.0	600.0	2352.8	339.3	181.2	48.1
IV	647.7	768.4	140.4	424.5	76.8	114.1	504.4	80.7	309.3	1055.5	454.7	68.2
V	661.7	479.5	82.8	-8.3	47.3	390.3	4874.2	2719.6	35.2	-21.8	23.5	21.1
VI	639.0	120.8	436.3	4.8	-27.7	159.0	172.6	102.0	73.0	255.4	106.6	135.1
VII	210.6	53.1	99.6	1296.4	421.2	130.5	296.8	101.5	101.3	158.3	62.7	111.1
VIII	55.9	27.9	32.0	-8.9	-6.1	11.1	74.6	22.5	88.8	29.0	-7.5	155.2
IX	29.5	-1.0	58.0	149.1	10.8	100.3	223.9	31.8	139.9	8.1	3.8	29.8
X	361.5	159.5	109.0	99.6	40.0	47.1	272.4	34.6	115.3	117.9	-13.4	151.9
XI	-21.6	-25.3	26.3	-3.7	-6.7	27.9	15.9	26.1	5.2	-54.4	-53.9	38.8
XII	19.7	21.2	26.7	14.5	-6.4	31.4	6.6	-18.1	47.9	-20.9	-26.3	41.3
XIII	44.3	16.9	21.8	38.0	-21.2	84.3	21.0	-29.7	105.3	-20.0	-48.7	87.5
XV	314.0	129.9	189.4	178.4	74.2	134.8	182.2	149.4	111.8	145.9	104.6	53.6
XVI	136.4	52.0	103.6	224.4	143.8	8.3	519.7	221.9	114.3	231.3	101.3	47.6
XVII	233.2	51.5	122.0	410.0	142.1	95.6	303.0	85.5	133.7	268.3	37.4	1.6
XVIII	448.6	199.9	53.9	209.9	49.4	109.5	213.8	147.3	40.7	295.7	19.4	81.4
XX	152.8	61.8	77.3	137.0	41.2	75.7	28.4	37.4	17.6	-46.1	-46.9	11.5
XXII	127.7	54.4	43.4	77.5	-88.2	306.3	595.8	247.8	310.4	221.5	-46.9	412.9

Source: Authors' computations, based on data from the National Institute of Statistics and TEMPO-on line.

However, there are product groups for which all the regions recorded positive changes (II – except for the Nord-Est region over the 2009-2013 period, IV – except for the Sud-Vest Oltenia region over the 2009-2013 period, VII, XVI and XVII). The last two groups mentioned include products with a (theoretically) medium and high technological level, which determines us to say that the change in the sectoral structure of the regional exports was partially towards increasing the competitiveness of the products exported on the foreign markets and towards deeper integration into the international value chains of medium and high technology. Also, the II and IV groups include products that (theoretically) turn to the best account the domestic agricultural raw materials that were poorly represented in the structure of national exports before Romania's accession to the EU because their low competitiveness, so that one may say that the change in the sectoral structure of exports was also towards increasing the quality and competitiveness of agricultural and agriculture-based products. Because at regional level more detailed data on exports are not available, we cannot deepen our analysis to examine how big and sustainable are (or not) the structural changes and the competitive advantages.

Further, considering the components of shift-share decomposition, over the 2005-2013 period the *national* effect was positive in all the regions, though of different magnitudes, signaling that the national export dynamics had a positive impact (pull effect) [4]. When we detail the analysis by the two mentioned sub-periods, the national effect revealed significant differences, suggesting different dynamics of the regional exports by product groups correlated with the national

dynamics, induced by the sectoral changes occurred in the Romanian economy. Thus, the positive national effect was higher in the 2009-2013 period as compared to the 2005-2008 period in all the regions in the case of product groups I, II, IV, VII, IX, XVI and XVII, which were approximately the same product groups that registered a positive structural change in all the regions.

In order to compare the *share* and *shift* effects for the exports by product groups in the analyzed regions over the 2005-2013 period, we employed an adaptation of the table classification proposed by D'Elia (2005), which combines the sectoral mix and the regional effects in the shape of diagrams. The analysis may be performed either for each product group for all the regions, or for each region for all the product groups and periods.

The results show that in the entire analyzed period in the case of the *exports of product groups V, VIII, XI, XII, XIII, XV and XX* the sectoral mix was negative in all the regions, but for different product groups this was compensated in all the regions by particular factor combinations that contributed to a better export performance (positive RS), as follows: Nord-Est (group XI), Sud-Est (groups V, VIII, XI, XII and XIII), Sud Muntenia (groups V, XIII, XV and XX), Bucuresti-Ilfov (group XV), Sud-Vest Oltenia (groups VIII, XI and XII), Vest (groups V, VIII, XII, XIII, XV and XX), Nord Vest (groups XI, XII, XIII, XV and XX) and Centru (groups V, VIII, XI, XII and XV). Similarly revealed is the reverse situation, of a positive sectoral mix and a negative regional change effect, which points towards certain regional and sectoral competitive factors that were not/are not fully exploited: Nord-Est (groups II, III, IV, VI, X, XVII and XVIII), Sud-Est (groups IV, VI, VII, IX, XVI, XVII and XVIII), Sud Muntenia (groups III, VI, IX, XVI and XXII), Bucuresti-Ilfov (groups I, VII, IX, X, XVII and XVIII), Sud-Vest Oltenia (groups VI, VII, IX, X and XVIII), Vest (groups I, II, IV, VII, IX, XVII, XVII and XXII), Nord-Vest (groups I, II, IV, VI, X, XVIII and XXII) and Centru (groups II, IV, XVII and XVIII).

From among the two analyzed sub-periods, we are mostly interested in the crisis and post-crisis period, 2009-2013, in order to find out the likely structural changes it has induced. In such a case, to the product groups previously-mentioned as registering a negative sectoral adds up group XVI, one of the product groups with high shares in the national and regional exports. Also in this period, the impact of a negative sectoral mix was compensated in the case of certain product groups in all the regions by positive regional change effects: Nord-Est (groups V, VIII, XI, XV and XVI), Sud-Est (groups V, VIII and XI), Sud Muntenia (groups XI, XII, XV and XXII), Bucuresti-Ilfov (groups VIII, XI, XII and XIII), Sud-Vest Oltenia (groups XII, XIII and XVI), Vest (groups V, XV, XVI and XXI), Nord-Vest (groups V, XIII, XV and XXII) and Centru (groups VIII, XII, XIII, XV and XVI). Under the circumstances of a sectoral positive mix, the sub-period is characterized by positive and/or negative evolutions of the regional change component for the exports of different product groups in all the regions (Table 2). The most obvious sectoral mobility of exports in a positive direction (both positive sectoral mix and regional change effect, or RS turned positive in the 2009-2013 period) is noticed in the Nord-Vest, Centru, Nord-Est, Bucuresti-Ilfov and Vest regions.

Table 2. Evolution of the regional change component (RS) for the exports of the CN product groups in the case of a positive sectoral mix in the 2009-2013 period, as against the entire analyzed period, 2005-2013

	Product groups with negative RS in the period 2005-2013 and negative in the period 2009-2013	Product groups with negative RS in the period 2005-2013 and positive in the period 2009-2013	Product groups with positive RS in the period 2005-2013 and negative in the period 2009-2013	Product groups with positive RS in the period 2005-2013 and positive in the period 2009-2013
Nord-Est	II, III, VI,	IV, X, XVII, XVIII,	XXII	I, VII, IX, X
Sud-Est	IV, VII, IX, XVII, XVIII	VI		I, II, III, X, XXII
Sud Muntenia	III, VI, IX, XXII		I, II, X	IV, VII, XVII, XVIII
Bucuresti-Ilfov	IX, XVII	I, VII, X, XVIII	II, III, IV	VI, XXII

Sud-Vest Oltenia	VI, VII, IX, X	XVIII	III, IV	I, II, XVII, XXII
Vest	I, II, IX, XXII	IV, VII, XVII	XVIII	III, VI, X
Nord-Vest	X, XXII	I, II, IV, VI, XVIII	IX	III, VII, XVII
Centru	XVIII	II, IV, XVII	I, VI, XXII	III, VII, IX, X

Source: Authors' computations, based on data from the National Institute of Statistics and TEMPO-on line.

Finally, the decomposition of the regional competitive effect reveals the lower share of the regional comparative advantage as compared to the allocation effect in all the regions and for all the product groups (except for group V – Table 3). The highest impact of the comparative advantage may be noticed in the Bucuresti-Ilfov and Vest regions and the lowest in the Sud-Vest Oltenia and Nord-Est regions, in accordance with the shares of these latter regions in the national exports by product groups.

Table 3. Decomposition of the regional change component for the exports of the main product groups, 2013 as against 2005

	Nord-Est		**Sud-Est**		**Sud Muntenia**		**Sud-Vest Oltenia**	
	ACR	CA	ACR	CA	ACR	CA	ACR	CA
I	2.1	23.8	6.8	40.9	1.9	13.9	0.5	7.6
II	-7.2	-80.1	44.5	268.2	3.5	25.3	1.2	17.6
III	-4.7	-52.1	7.5	45.2	-6.6	-47.0	0.0	0.3
IV	-9.5	-105.4	-5.8	-35.0	13.3	95.6	0.6	8.7
V	-216.2	-155.2	58.2	556.0	15.8	71.2	-21.9	13.0
VI	-2.5	-28.2	-5.7	-34.2	-44.5	-319.3	-10.1	-153.2
VII	0.8	8.4	-3.5	-21.2	2.6	18.9	-8.2	-124.0
VIII	-0.6	-6.9	0.2	1.4	-0.7	-5.0	0.9	13.8
IX	7.3	81.3	-3.8	-22.9	-3.7	-26.4	-2.2	-32.9
X	-1.8	-20.5	0.0	0.1	1.1	7.6	-0.3	-4.0
XI	8.7	96.2	8.8	52.9	-3.0	-21.8	4.6	69.7
XII	-3.4	-38.1	1.1	6.9	-0.9	-6.3	0.3	4.6
XIII	-0.7	-7.4	0.7	4.0	4.3	31.1	-0.1	-1.7
XV	-8.2	-90.4	-153.3	-924.6	16.7	119.8	-11.6	-177.0
XVI	10.1	112.3	-0.8	-4.6	-44.4	-318.5	5.1	77.8
XVII	-0.5	-5.5	-125.1	-754.5	177.5	1272.2	25.8	391.4
XVIII	-2.3	-25.6	0.0	-0.2	5.5	39.2	0.0	-0.7
XX	-8.7	-96.0	-4.4	-26.6	27.1	194.4	-1.1	-16.6
XXII	0.4	4.8	2.7	16.2	-12.3	-88.4	2.8	42.3
	Vest		**Nord-Vest**		**Centru**		**Bucuresti-Ilfov**	
	ACR	CA	ACR	CA	ACR	CA	ACR	CA
I	-12.7	-68.1	-0.2	-1.5	1.3	10.2	-5.7	-21.0
II	-25.3	-135.9	-24.6	-194.5	-2.2	-18.2	27.2	100.6
III	0.2	1.2	5.8	45.8	0.1	1.2	0.6	2.4
IV	-0.9	-5.1	-8.4	-66.0	-3.0	-24.4	30.9	114.4
V	9.2	-2.0	0.0	-2.7	98.4	-81.1	0.0	-342.6
VI	35.3	189.9	-8.8	-69.2	7.8	64.0	80.5	298.0
VII	-4.6	-24.8	29.7	234.7	4.7	38.1	-32.3	-119.5
VIII	0.0	0.2	-1.9	-15.3	1.9	15.9	-0.9	-3.1
IX	-14.2	-76.4	1.8	14.3	29.2	238.7	-40.4	-149.7

X	2.2	12.0	-1.6	-12.8	2.9	23.3	-1.7	-6.4
XI	-10.1	-54.3	4.4	35.0	16.2	132.5	-72.3	-267.5
XII	7.9	42.4	4.2	33.0	0.2	1.9	-11.5	-42.5
XIII	0.4	2.3	0.1	1.1	-0.9	-7.3	-5.5	-20.5
XV	49.0	263.5	33.5	264.5	25.3	207.4	82.0	303.4
XVI	-153.1	-823.1	5.7	45.2	106.4	870.9	23.6	87.3
XVII	-97.0	-521.8	0.8	6.5	-24.7	-202.0	-30.4	-112.7
XVIII	8.6	46.0	-3.3	-26.0	-3.1	-25.4	-2.7	-9.9
XX	21.5	115.5	18.1	142.9	-12.4	-101.3	-53.7	-198.9
XXII	-0.8	-4.3	-1.7	-13.1	2.9	23.6	5.3	19.5

Source: Authors' computations, based on data from the National Institute of Statistics and TEMPO-on line.

4. CONCLUSIONS

By the means of standard shift-share analysis, the paper attempted to assess the sectoral development gaps and the external competitiveness of the Romanian regions from the perspective of *regional foreign trade*, namely of *exports*.

The dynamics of Romanian regional exports over the period 2005-2013 revealed two relatively distinct sub-periods: 2005-2008 (pre-crisis) and 2009-2013 (crisis and post-crisis), with a significant decline in 2009 and partial in 2012, overall and for the main product groups (as according to the CN classification), with certain regional and/or sectoral peculiarities. The change in the sectoral structure of regional exports was partially towards increasing the competitiveness of some product groups with medium and high technological level on the foreign markets and towards a deeper integration into the international value chains of medium and high technology, but also partially towards increasing the quality and competitiveness of agriculture-based products, poorly represented in the national exports before Romania's accession to the EU because of their low competitiveness.

Considering the shift-share decomposition, over the period 2005-2013 the *national* effect was positive in all the regions, signaling a positive impact of the national exports as growth factor at regional level. By sub-periods, the national effect was different, suggesting different dynamics of regional exports correlated with the national sectoral dynamics induced by crisis. The national positive effect was higher in the post-crisis period for approximately the same product groups that registered positive strucural changes in all the regions.

As regards the *sectoral mix* and *competitive change* effects, over the entire analyzed period were found product groups with negative sectoral mix in all the regions; however, compensated in some cases by specific factor combinations that determined a better export performance. Similarly obvious in all the regions was the reverse situation, of product groups with positive sectoral mixes and negative regional change effects, signaling untapped regional and/or sectoral potentials for export growth. During the crisis and post-crisis period, a negative sectoral mix was also registered by group XVI, one of the product groups with high shares in the regional and national exports, and high importance for the regional (and sub-regional) economies. In the presence of a positive sectoral mix, the sub-period is also characterized by *positive sectoral export mobility* (also positive regional change or regional change turned positive in the 2009-2013 sub-period) for different product groups, the highest in the Nord-Vest, Centru, Nord-Est, Bucuresti-Ilfov and Vest regions. Finally, it was revealed that the regional comparative advantage has a lower share in the regional change as compared to the allocation component, its highest impact being registered in the Bucuresti-Ilfov and Vest regions, and its lowest impact in the Sud-Vest Oltenia and Nord-Est regions, in accordance with the share of the latter regions in the structure of national exports.

Such an analysis may bring new insights into the economic growth processes occurring in the regional/sub-regional economies of Romania, and may provide useful ideas for both general and specific policies, such as the territorial cohesion policy (with emphasis on both urban and rural

growth), the competitiveness policy (with emphasis on cluster development and sustainability, for instance), the education and R&D policy, etc.

[1] The paper presents some partial research results of the research theme Coeziunea economico-socială a României în perspectiva Strategiei Europa 2020, Partea a-II-a, coordinator Iordan Marioara, Institute for Economic Forecasting, Bucharest, Romania, 2014, mimeo.

[2] The analyzed main product groups classified as according to CN are the following: I – Live animals and animal products, II – Vegetable products, III – Vegetable and animal fats and oils, IV – Food, beverages, tobacco, V – Mineral products, VI – Chemical products and connected, VII – Plastic, rubber, and articles thereof, VIII – Raw hides and skins, leather, fur skins and articles thereof, IX – Wood products, cork and wickerwork, X – Pulp, waste paper or cardboard, paper and cardboard and articles thereof, XI – Textiles and articles thereof, XII – Footwear, headgear, umbrellas and articles thereof, XIII – Articles of cement, stone, ceramic, glass, and other similar materials, XV – Basic metals and articles thereof, XVI – Machinery and equipment, sound and image recorders and reproducers, XVII – Transport means, XVIII – Optical, photographic, cinematographic, measuring, precision, checking and medical instruments, XX – Miscellaneous manufactured articles, XXII – Other products, not elsewhere classified.

[3] The results are not presented in the paper, due to space restrictions, but are available upon request.

[4] The results for the national effect and the share and shift effects are available upon request.

BIBLIOGRAPHY

1. Sandra Baxendine, Bill Cochrane, Jacques Poot (2005), *Description and Spatial Analysis of Employment Change in New Zealand Regions 1986-2001*, Population Studies Centre Discussion Papers No. 57, November, University of Waikato, Hamilton, New Zealand.
2. R. Camagni (2002), *On the concept of territorial competitiveness: sound or misleading?*, Paper presented at the ERSA Conference, Dortmund, August.
3. Mihaela-Nona Chilian (2013), *Coeziunea economico-socială la nivel regional – Elemente de fundamentare a unei strategii naţionale*, Editura Expert, Bucureşti, România.
4. M.N. Chilian (2012), Evolution of Regional and Sub-Regional Disparities in Romania – A Sectoral Shift-Share Analysis, *Romanian Journal of Economic Forecasting*, Vol. XV, No. 1, pp. 187-204.
5. M.N. Chilian (2011), Competitivitatea economiei româneşti şi integrarea în Uniunea Europeană, Editura Universitară, Bucureşti, 2011.
6. Marioara Iordan (coordonator) (2013), *Coeziunea economico-socială în România din perspectiva Strategiei Europa 2020* – Institutul de Prognoză Economică, Bucuresti, manuscris.
7. Sandy Dall'erba, Yiannis Kamarianakis, Julie Le Gallo, Maria Plotnikova (2003), *Regional Productivity Differentials in Poland, Hungary and the Czech Republic*, REAL 03-T-26, August.
8. Gardiner, R. Martin, P. Tyler (2004), *Competitiveness, Productivity and Economic Growth across the European Regions*, University of Cambridge, UK, May.
9. José Luis Iparraguirre D'Elia (2005), Labour Productivity, *Gross Value Added and Employment by Industry in Northern Ireland. A Structural and Shift-Share Analysis*, Economic Research Institute of Northern Ireland ERINI Monograph 6, December.
10. Yiannis Kamarianakis, Julie Le Gallo (2003), *The evolution of regional productivity disparities in the European Union, 1975-2000*, Groupement de Recherches Economiques et Sociales (GRES), Cahiers du GRES 2003-15, Décembre.
11. Pierre-Yves Leo and Jean Philippe (2005), Business Services, the New Engine of French Regional Growth, *The Service Industries Journal*, Vol. 25, No.2, March, pp.141–161.
12. Esteban-Marquillas, J.M. (2000) "Regional convergence in Europe and the industry mix: a shift-share", *Regional and Urban Economics*, 30: 253-364.
13. Matías Mayor Fernández, Ana Jesús López Menéndez (2005), *Spatial shift-share analysis: new developments and some findings for the Spanish case*, 45th Congress of the European Regional Science Association.

14. Matías Mayor Fernández, Ana Jesús López Menéndez (2002), *The Evolution of the Employment in the European Union. A Stochastic Shift and Share Approach*, ERSA Congress, Dortmund.
15. Ann C. Selting, Scott Loveridge (1992), *A Summary of the Literature on Shift-Share Analysis*, Staff Paper P92-13, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota, USA, June.
16. David Wadley, Phillip Smith (2003), Straightening up shift-share analysis, *The Annals of Regional Science* 37:259–261.