Evaluation of the Branch Competitiveness of the Regions of the Central Federal District in 2005–2009 Using the Shift-Share Analysis Technique[1]

L. E. Limonov and S. N. Rastvortseva

Abstract—The possibility of determining the branch competitiveness of regions using the shift-share analysis technique is considered. It allows for the revealing of the formation factors of competitiveness and evaluating their effects in terms of three directions: effect of changes in the national economy, regional development stimuli, and internal efficiency factor of a particular branch in the region. A comparative analysis is carried out, where the Central Federal District of Russia in 2005–2009 serves as an example. Graphical analysis on the basis of three parameters, namely, GRP, number of employed in the economy, and labor productivity, made it possible to decompose the branch shift of regional economies into the following components: *DIF* effect (contribution of a branch's internal efficiency), *MIX* effect (effect of the structure of the regional economy), and the effect of national development factors. The determination of branches capable of being growth drivers for the region will make it possible for regional efficiency management entities to purposefully create favorable conditions and stimuli for the balanced development of the region.

Keywords: efficiency of regional economic development, shift-share analysis, regional competitiveness, branch structure of a regional economy.

The recent economic crisis has demonstrated the inefficiency of the branch structures of a number of regional economies of Russia. Branches identified as top-priority ones and strategic for social and economic development turned out to be strongly dependent on world economic conditions. In the meantime, it is export-oriented branches that often form the base of regional economies, and the dynamics of the development of which affects other activities. Therefore, in order to develop regional policies and regulations aimed at increasing competitiveness, it is necessary to define which branches are the most competitive, what forms their competitiveness, and what the effect of external conditions and stimuli from the national and global economies on the regional economy is.

The investigation is focused on shift-share analysis in regional economies of the Central Federal District (CFD) of Russia for further determination of the available competitive advantages when the foreign-trade factor is taken into account. Individual sectors of regional economies, such as agriculture, mining industry, manufacturing industry, wholesale and retail, financial activities, and the service industry, are defined as objects of investigation. The investigation covers the period of 2005–2009, i.e., the precrisis and postcrisis periods. A comparison of the obtained results makes it possible to determine the effect of crisis phenomena on the development of regional economies.

METHODOLOGICAL BASIS OF THE INVESTIGATION

The methodology of the shift-share analysis, which was developed as early as the late 1950s (see [8, 10]) and have recently been widely applied in a series of

[1] This paper is an updated version of the paper "Efficiency Evaluation of the Use of Competitive Advantages of a Regional Economy: Shift-Share Analysis" by L.E. Limonov and S.N. Rastvortseva that was first published in Russian in *Finansy i biznes*, in 2010, no. 1, pp. 35–46. The data for 2008 and 2009 have been taken into consideration in the present publication. The shift-share analysis is not only carried out with respect to the GRP dynamics, but also with respect to the number of employed in the economy and labor productivity. The competitive advantages of the agricultural and mining industries' sectors were defined, considering the changes in global market conditions.

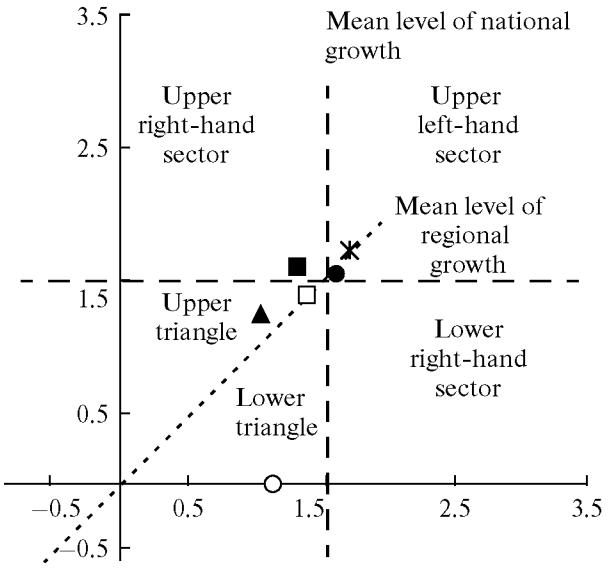

Fig. 1. Main sectors of a graphical shift-share analysis of the branches of the regional economy.

European and global studies on regional economies (see, for example, [5–7, 11, 12), makes it possible to split regional growth into three components, namely, growth affected by the national economy, growth affected by regional economic stimuli and the branch structure, and the internal efficiency factor of a particular branch.

The effect of the national economy on regional development may under certain circumstances act as a competitive advantage and become a growth driver. The national economy creates externalities with respect to the region. They may appear as a result of interaction between branches via the costs/output ratio and provide growth of the whole regional economy with the initial impulse generated within an individual branch. Externalities may appear based on the demand–supply scheme. They determine the growth in supply for those fields that are sought for by the external market (with respect to the region). These externalities may appear as a result of external investments into infrastructural objects, which are defined based on the demand for those objects in the region.

The effect of national factors on the operation efficiency of individual branches in the region can be determined using the formula

$$NS_{ir} = \frac{E_{ir}^0}{E_r^0}\left(\frac{E_n^1}{E_n^0} - 1\right) \times 100\% \qquad (1)$$

where NS_{ir} is the effect of the national factor on the development of branch i in the region (%); E is the key evaluation parameter of branch development in region r and the national economy n (employment, volume of output, etc.); and i represents a branch or sector of the economy.

If the $E_{ir}^0\left(\frac{E_n^1}{E_n^0} - 1\right)$ part of the parameter is used, we can determine changes in regional parameters under the condition of their growth rates being equal to the national ones.

The regional conditions of economic development per se are the second component of regional growth. The *MIX* effect reflects the influence of the overall regional development level on the increment of the parameter in a particular branch:

$$DIF_{ir} = \frac{E_{ir}^0}{E_r^0}\left(\frac{E_{ir}^1}{E_{ir}^0} - \frac{E_m^1}{E_m^0}\right) \times 100\%, \qquad (2)$$

where MIX_{ir} is the effect of the regional economic structure on the development of branch i in the region (%).

The internal efficiency of regional branches (DIF_{ir}) per se is the third factor of regional growth. The contribution of a branch's efficiency to the growth of a regional economy is evaluated as follows:

$$DIF_{ir} = \frac{E_{ir}^0}{E_r^0}\left(\frac{E_{ir}^1}{E_{ir}^0} - \frac{E_{in}^1}{E_{in}^0}\right) \times 100\%. \qquad (3)$$

Graphical analysis makes it possible to decompose the branch shift of a regional economy into components (Fig. 1). The *DIF* effect is represented by branches, which are graphically located above the graph's diagonal. They determine the regional competitiveness and present opportunities for regional growth exceeding the national one.

The *MIX* effect is positive for branches located to the right of the mean-level line of national growth. This effect is peculiar for branches with outrunning growth (above average) at the national level. The region's specialization in these branches will provide local growth governed by growth in demand at the national level and a larger number of branches with outrunning growth rates in the regional economy in comparison with the whole economy of the country. Thus, the investigated shift-share area of the regional economy can be divided into five sectors (see Fig. 1) [5, pp. 95–99].

The upper triangle represents branches and activities, the competitiveness of which is mostly provided by national factors and which have perspectives for further development due to their own efficiency.

The lower triangle represents branches-outsiders in the region. These branches have low internal development efficiency, and there are no conditions created in the region for their further development. They can be competitive if there is a demand from other regions of the country. In the meantime, an increase in their internal efficiency can create prerequisites for the formation of a competitive advantage of the region based on these branches.

The upper left-hand sector represents branches, for which internal efficiency supported by national factors is the main development stimulus.

The lower right-hand sector represents branches with low internal efficiency, the development of which occurs due to the demand exhibited by the regional economy and affected by national factors.

The upper right-hand sector represents branches with high internal efficiency, the development of which is also sought for by regional and national economies.

We carry out a comparative shift-share analysis of the regional economies of the CFD for 2005–2009 in accordance with the following algorithm:

1. We determine the main shift-share parameters in the regional economies on the basis of GRP (gross regional product), number of employed in the economy (GRP indices and the number of employed in individual sectors of the economy; shares of economic sectors in GRP and the numbers of employed in 2005 and 2009; the effect of national and regional factors and internal efficiency on the development of individual sectors of the economy).

2. We carry out a graphic analysis of the shift-share decomposition in the regional economies with respect to the parameters of the GRP dynamics and the number of employed in the economy.

3. We determine the competitive advantages of the regions' economic sectors, considering the changes in labor productivity and the possible effect of global market conditions.

SHIFT-SHARE ANALYSIS BASED ON GRP

In order to exclude the effect of inflation on the GRP dynamics, we present the parameter at comparative prices (at 2005 prices in our case) for the Russian Federation as a whole and individual regions of the CFD. The main shift-share parameters in the regional economies of the CFD based on GRP are presented in Table 1.

The share of agriculture in the Russian economy is 5.2–5.5% of GDP. Traditionally, the regions of the CFD can be identified as agricultural ones: only in Moscow and Yaroslavl oblasts and Moscow, the shares of agriculture in GRP do not exceed the mean value for Russia. Agribusiness plays a significant role in Belgorod (the share of agriculture in GRP in 2009 was 16.3%), Tambov (15.6%), Kursk and Orel (both 13.2%), Voronezh and Kostroma (both 11.8%), Ryazan (11.6%), and Bryansk (11%) oblasts. Positive dynamics is observed in the volume of business done by agricultural enterprises in the following of the above-listed regions: Belgorod (72% in 2005–2009), Voronezh (48%), Tambov (26%), and Ryazan (1%) oblasts. It should be mentioned that the share of agriculture in GRP increased in 2005–2009 in Belgorod (by 4.7%), Voronezh (by 1.3%), and Tambov (by 0.1%) oblasts. The shift-share analysis previously carried out in 2005–2007 [1] showed high internal efficiency levels in agriculture of Voronezh (7.2%), Tambov (5.33%), and Belgorod (3.08%) oblasts.

The share of mineral resource mining as part of the country's GDP decreased significantly in the analyzed period (by 3.06%). This sector of the economy is only present in Belgorod (21.9% and 8.4% in GRP in 2005 and 2009, respectively) and Kursk (18 and 6.6%, respectively) oblasts among all CFD regions (it is mostly iron ore mining from the Kursk Magnetic Anomaly basin). It should be mentioned that a sharp decrease in mining volumes occurred in both regions in the analyzed period: 53% in Belgorod oblast and 63% in Kursk oblast. The shift-share analysis for 2005–2007 (same regions) showed that the efficiency in the mining industry was only observed in Belgorod oblast (3.77%), which determined the development of this sector of the economy as the region's competitive advantage. However, a sharp decrease in mining volumes (and the sector's share in GRP) occurred in the region in 2007–2009; this makes it necessary to carry out an additional analysis aimed, in addition, at discovering the possible effects of global market conditions on the reduction in the mining volumes of mineral resources in these regions.

The mean share of industry in GRP of the CFD regions was 31.2% in 2005 and 27.8% in 2009. The category of industrial regions, in which the sector's share in GRP exceeded the mean value for the district, can be considered consisting of Lipetsk (the share of industry in GRP was 46.2% in 2009), Vladimir (34.1%), Kaluga (33.9%), Kursk (32.4%), Tula (35.42%), Kostroma (30.7%), Ryazan and Yaroslavl (both 30.5%), and Smolensk (28.5%) oblasts. Increases in the volumes of industrial output occurred in 2005–2009 in the following of the above-listed regions: Kaluga (by 36%), Kursk (by 10%), Ryazan (by 9%), Vladimir (by 8%), and Kostroma (by 4%) oblasts. The share of industry in GRP in the CFD tends to fall in all regions, apart from Kursk (2.6% growth) and Ryazan (1.4%) oblasts and Moscow (3.1%)[2]. We find that only an additional analysis would make it possible to define the regions, in which this branch will be competitive and efficient.

Wholesale and retail in the regions of the CFD tends to increase in terms of both absolute turnover and share in GRP. Exceptions are Lipetsk (reduction in turnover of 19% and reduction in the share in GRP of 1%), Ryazan (15 and 3.5%, respectively), Tula (15 and 3.1%), and Yaroslavl (17 and 1.45%) oblasts and Moscow (21 and 11.4%). A reduction in the sector's share in GRP accompanied with growth in

[2] The share of industry in GRP of Moscow is insignificant (14.96% in 2005 and 18.1% in 2009); therefore, the development of the economy's industrial sector will not be considered further as the region's competitive advantage.

Table 1. Main shift-share parameters in the regional economies of the CFD in 2005–2009 (by GRP)

Region/Economic sector	Changes in 2009 compared to 2005, index	Share of the economic sector in GRP, %		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Russian Federation						
Total	**1.07**	**100**	**100**	–	–	–
Agriculture	1.01	5.50	5.20	–	–	–
Mining of mineral resources	0.81	12.76	9.70	–	–	–
Industry	1.02	22.33	21.30	–	–	–
Wholesale and retail trade	0.90	21.77	18.40	–	–	–
Financial activity	0.58	1.10	0.60	–	–	–
Services	1.31	36.55	44.80	–	–	–
Belgorod oblast						
Total	**1.23**	**100**	**100**	**6.66**	**–3.43**	**19.58**
Agriculture	1.72	11.6	16.3	0.77	–0.67	8.29
Mining of mineral resources	0.47	21.9	8.4	1.46	–5.59	–7.43
Industry	1.16	26.5	25.1	1.76	–1.30	3.86
Wholesale and retail trade	1.55	13.6	17.1	0.90	–2.24	8.77
Financial activity	0	0	0	0	0	0
Services	1.54	26.4	33.1	1.76	6.36	6.09
Bryansk oblast						
Total	**1.06**	**100**	**100**	**6.66**	**5.71**	**–6.76**
Agriculture	0.81	14.3	11.0	0.95	–0.82	–2.80
Mining of mineral resources	0.78	0.1	0.1	0.01	–0.03	0
Industry	0.86	26.5	21.6	1.76	–1.30	–4.10
Wholesale and retail trade	1.27	15.7	18.9	1.04	–2.59	5.80
Financial activity	0	0	0	0	0	0
Services	1.18	43.4	48.4	2.89	10.45	–5.65
Vladimir oblast						
Total	**1.27**	**100**	**100**	**6.66**	**3.14**	**17.58**
Agriculture	0.86	10.9	7.4	0.73	–0.63	–1.59
Mining of mineral resources	1.90	0.3	0.4	0.02	–0.07	0.29
Industry	1.08	40.1	34.1	2.67	–1.97	2.64
Wholesale and retail trade	1.59	10.7	13.3	0.71	–1.76	7.34
Financial activity	1.10	2.2	1.9	0.15	–1.07	1.15
Services	1.52	35.9	42.9	2.39	8.63	7.76
Voronezh oblast						
Total	**1.31**	**100**	**100**	**6.66**	**4.67**	**20.03**
Agriculture	1.48	10.5	11.8	0.70	–0.60	4.90
Mining of mineral resources	1.65	0.4	0.5	0.03	–0.10	0.33
Industry	1.15	24.7	21.7	1.65	–1.22	3.34
Wholesale and retail trade	1.24	21.5	20.2	1.43	–3.54	7.19
Financial activity	2.38	0.3	0.5	0.02	–0.13	0.50
Services	1.40	42.6	45.3	2.84	10.26	3.78
Ivanovo oblast						
Total	**1.12**	**100**	**100**	**6.66**	**7.15**	**–1.39**
Agriculture	0.76	8.7	5.9	0.58	–0.50	–2.17
Mining of mineral resources	0.77	0.3	0.2	0.02	–0.07	–0.01
Industry	0.93	30.1	24.9	2.01	–1.48	–2.67
Wholesale and retail trade	1.35	13.4	16.1	0.89	–2.21	6
Financial activity	0	0	0	0	0	0
Services	1.25	47.4	52.9	3.16	11.42	–2.54

Table 1. (Contd.)

Region/Economic sector	Changes in 2009 compared to 2005, index	Share of the economic sector in GRP, %		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Kaluga oblast						
Total	**1.26**	**100**	**100**	**6.66**	**4.24**	**15.38**
Agriculture	1.00	11.3	9.0	0.75	–0.65	–0.08
Mining of mineral resources	1.83	0.4	0.6	0.03	–0.11	0.42
Industry	1.36	31.5	33.9	2.10	–1.55	10.78
Wholesale and retail trade	1.02	17.5	14.2	1.17	–2.89	2.12
Financial activity	0	0	0	0	0	0
Services	1.36	39.2	42.3	2.61	9.44	2.14
Kostroma oblast						
Total	**1.07**	**100**	**100**	**6.66**	**5.67**	**–5.79**
Agriculture	0.74	16.9	11.8	1.12	–0.97	–4.48
Mining of mineral resources	0.93	0.1	0.1	0.01	–0.03	0.01
Industry	1.04	31.4	30.7	2.09	–1.54	0.76
Wholesale and retail trade	1.37	10.3	13.3	0.69	–1.70	4.86
Financial activity	0	0.01	0	0	–0.01	–0.01
Services	1.14	41.2	44.1	2.74	9.93	–6.92
Kursk oblast						
Total	**1.01**	**100**	**100**	**6.66**	**–1.46**	**–4.05**
Agriculture	0.89	15.1	13.2	1.00	–0.87	–1.86
Mining of mineral resources	0.37	18.0	6.6	1.20	–4.60	–7.91
Industry	1.10	29.8	32.4	1.98	–1.46	2.45
Wholesale and retail trade	1.54	8.3	12.6	0.55	–1.36	5.29
Financial activity	0	0.2	0	0.01	–0.08	–0.10
Services	1.24	28.7	35.2	1.91	6.91	–1.91
Lipetsk oblast						
Total	**0.89**	**100**	**100**	**6.66**	**0.39**	**–17.58**
Agriculture	1.11	7.2	8.9	0.48	–0.41	0.74
Mining of mineral resources	1.10	0.6	0.7	0.04	–0.15	0.16
Industry	0.71	58.3	46.2	3.88	–2.87	–17.99
Wholesale and retail trade	0.81	10.4	9.4	0.69	–1.72	–0.97
Financial activity	0.46	0.2	0.1	0.01	–0.10	–0.02
Services	1.33	23.4	34.7	1.56	5.63	0.50
Moscow oblast						
Total	**1.28**	**100**	**100**	**6.66**	**4.11**	**16.89**
Agriculture	0.78	4.4	2.7	0.29	–0.25	–1.00
Mining of mineral resources	2.12	0.2	0.3	0.01	–0.05	0.24
Industry	1.09	31.2	26.6	2.08	–1.54	2.17
Wholesale and retail trade	1.33	20	20.8	1.33	–3.30	8.53
Financial activity	0.46	1.9	0.7	0.13	–0.94	–0.22
Services	1.48	42.3	48.9	2.81	10.17	7.18
Orel oblast						
Total	**1.04**	**100**	**100**	**6.66**	**5.37**	**–8.35**
Agriculture	0.95	14.4	13.2	0.96	–0.83	–0.85
Mining of mineral resources	1.81	0.1	0.1	0	–0.01	0.06
Industry	0.78	29	21.7	1.93	–1.43	–7.02
Wholesale and retail trade	1.16	14.6	16.4	0.97	–2.41	3.81
Financial activity	0	0.05	0	0	–0.02	–0.03
Services	1.20	41.8	48.6	2.78	10.07	–4.31

Table 1. (Contd.)

Region/Economic sector	Changes in 2009 compared to 2005, index	Share of the economic sector in GRP, %		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Ryazan oblast						
Total	**1.04**	**100**	**100**	**6.66**	**3.88**	**–6.53**
Agriculture	1.01	12	11.6	0.80	–0.69	–0.05
Mining of mineral resources	0.82	0.4	0.3	0.03	–0.10	0
Industry	1.09	29.1	30.5	1.94	–1.43	2.09
Wholesale and retail trade	0.85	19.6	16.1	1.30	–3.23	–0.92
Financial activity	0	0.04	0	0	–0.02	–0.02
Services	1.11	38.9	41.5	2.59	9.35	–7.63
Smolensk oblast						
Total	**1.06**	**100**	**100**	**6.66**	**3.61**	**–4.18**
Agriculture	0.70	11.4	7.5	0.76	–0.65	–3.55
Mining of mineral resources	1.04	0.5	0.5	0.03	–0.13	0.12
Industry	0.96	31.4	28.5	2.09	–1.54	–1.68
Wholesale and retail trade	1.08	19.03	19.4	1.27	–3.14	3.42
Financial activity	0	0	0	0	0	0
Services	1.24	37.7	44.1	2.51	9.07	–2.48
Tambov oblast						
Total	**1.25**	**100**	**100**	**6.66**	**4.25**	**13.99**
Agriculture	1.26	15.5	15.6	1.03	–0.89	3.84
Mining of mineral resources	0	0	0	0	0	0
Industry	0.93	20.2	15.1	1.34	–0.99	–1.68
Wholesale and retail trade	1.38	23	25.5	1.53	–3.80	11.08
Financial activity	0	0.01	0	0	0	0
Services	1.33	41.3	43.8	2.75	9.93	0.77
Tver oblast						
Total	**1.24**	**100**	**100**	**6.66**	**6.44**	**10.66**
Agriculture	0.88	8.3	5.9	0.55	–0.48	–1.07
Mining of mineral resources	2.48	0.1	0.2	0.01	–0.03	0.17
Industry	1.12	29.3	26.5	1.95	–1.44	2.99
Wholesale and retail trade	1.35	16.3	17.8	1.08	–2.69	7.33
Financial activity	0	0	0	0	0	0
Services	1.33	46	49.6	3.06	11.07	1.25
Tula oblast						
Total	**1.04**	**100**	**100**	**6.66**	**2.32**	**–5.07**
Agriculture	0.83	8.9	7.1	0.59	–0.51	–1.57
Mining of mineral resources	1.10	0.3	0.3	0.02	–0.07	0.08
Industry	0.81	40.8	32.0	2.72	–2.01	–8.27
Wholesale and retail trade	0.85	17.4	14.3	1.16	–2.87	–0.85
Financial activity	3.04	0.1	0.3	0.01	–0.05	0.25
Services	1.47	32.5	46.0	2.16	7.83	5.29

Table 1. (Contd.)

Region/Economic sector	Changes in 2009 compared to 2005, index	Share of the economic sector in GRP, %		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Yaroslavl oblast						
Total	**0.92**	**100**	**100**	**6.66**	**5.49**	**–20.59**
Agriculture	0.81	4.9	4.3	0.33	–0.28	–0.99
Mining of mineral resources	1.13	0.1	0.1	0.01	–0.02	0.03
Industry	0.76	36.9	30.5	2.46	–1.81	–9.65
Wholesale and retail trade	0.83	15.5	14	1.03	–2.55	–1.11
Financial activity	0	0.2	0	0.01	–0.07	–0.09
Services	1.10	42.5	51.1	2.83	10.23	–8.77
Moscow						
Total	**1.06**	**100**	**100**	**6.66**	**–0.82**	**0**
Agriculture	0	0.02	0	0	–0.001	–0.02
Mining of mineral resources	0	0	0	0	0	0
Industry	1.28	15	18.1	1	–0.74	3.94
Wholesale and retail trade	0.79	44.4	33	2.95	–7.32	–5.07
Financial activity	0.51	3.5	1.7	0.23	–1.71	–0.24
Services	1.34	37.2	47.2	2.47	8.94	1.39

wholesale and retail turnovers occurred in Voronezh (1.3%) and Kaluga (3.3%) oblasts.

The growth in the share of the service industry in GRP of all regions of the CFD is emblematic. The mean growth in the share ranged from 38.2% in 2005 to 44.4% in 2009. Regions with shares above the mean level (as of 2009) include Bryansk (48.4%), Voronezh (45.3%), Ivanovo (52.9%), Moscow (48.9%), Orel (48.6%), Tver (49.6%), Tula (46%), and Yaroslavl (51.1%) oblasts and Moscow (47.2%).

The results of an analysis of the GRP dynamics in the CFD regions by economic sectors showed that the financial sector was the weakest aspect of development. In six regions of the district, this sector was not present in GRP; in another six, it had been present until 2009. The rest of the regions had an extremely insignificant presence of the financial sector (within 3.5%).

SHIFT-SHARE ANALYSIS BY THE NUMBER OF EMPLOYED IN THE ECONOMY

The methodology of the shift-share analysis can not only be applied in the decomposition of GRP by economic sectors, but also in the distribution of the number of employed in the region's economy by activities. What is interesting about this approach is that it makes it possible to present the situations in various sectors of the region's economy from the perspective of employment. Thus, although the financial sector in the region does not contribute to GRP (i.e., banks operating on the region's territory are either registered in other regions or are foreign), the share of employed in the financial sector is nonzero, which provides data for analysis. In addition, if we consider the fact that the period of 2008–2009 was a crisis one, an analysis of the dynamics of the number of employed in economic sectors will make it possible to identify the more flexible branches in the region. We carry out a shift-share analysis in the economies of the regions of the CFD by the number of employed (Table 2).

The effect of national factors on the development of the economies of the CFD regions by the number of employed is negative (–2.56)[3]. A positive effect of regional factors of development is only observed in Moscow oblast (0.69) and Moscow (5.69). However, it should be emphasized that regional factors only negatively affect the development of the primary and secondary sectors of the economy (agriculture, mining, and manufacturing). The effect of regional factors on

[3] For comparison, the effect of national factors by GRP is positive with a value of 6.66.

Table 2. Main shift-share parameters in the regional economies of the CFD in 2005–2009 (by the number of employed)

Region/ Economic sector	Changes in 2009 compared to 2005, index	Share of the sector in the number of employed in the regional economy		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Russian Federation						
Total	**0.97**	**100**	**100**	–	–	–
Agriculture	0.66	7.19	4.89	–	–	–
Mining of mineral resources	0.91	1.77	1.65	–	–	–
Industry	0.87	22.23	19.74	–	–	–
Wholesale and retail trade	1.18	9.25	11.23	–	–	–
Financial activity	1.17	1.64	1.96	–	–	–
Services	1.02	57.91	60.52	–	–	–
Belgorod oblast						
Total	**1.04**	**100**	**100**	**–2.56**	**–2.36**	**8.95**
Agriculture	0.82	12.52	9.83	–0.32	–3.91	1.94
Mining of mineral resources	1.34	3.05	3.93	–0.08	–0.20	1.31
Industry	1.11	21.04	22.55	–0.54	–2.30	5.25
Wholesale and retail trade	1.34	6.46	8.30	–0.17	1.35	1.00
Financial activity	1.09	1.37	1.43	–0.04	0.26	–0.11
Services	1.01	55.56	53.95	–1.42	2.44	–0.45
Bryansk oblast						
Total	**0.92**	**100**	**100**	**–2.56**	**–1.86**	**–3.25**
Agriculture	0.62	8.92	5.96	–0.23	–2.79	–0.40
Mining of mineral resources	0.22	0.12	0.03	0	–0.01	–0.08
Industry	0.79	28.37	24.41	–0.73	–3.10	–2.01
Wholesale and retail trade	1.29	6.76	9.42	–0.17	1.41	0.69
Financial activity	0.97	1.13	1.19	–0.03	0.22	–0.22
Services	1.00	54.71	59.00	–1.40	2.40	–1.24
Vladimir oblast						
Total	**1.02**	**100**	**100**	**–2.56**	**–1.51**	**5.69**
Agriculture	0.75	5.07	3.75	–0.13	–1.58	0.45
Mining of mineral resources	0.74	0.39	0.28	–0.01	–0.03	–0.07
Industry	0.85	37.45	31.43	–0.96	–4.09	–0.46
Wholesale and retail trade	1.12	9.10	10.04	–0.23	1.90	–0.57
Financial activity	1.27	1.19	1.49	–0.03	0.23	0.12
Services	1.15	46.80	53.01	–1.20	2.05	6.21
Voronezh oblast						
Total	**0.98**	**100**	**100**	**–2.56**	**–1.36**	**2.35**
Agriculture	0.71	12.23	8.80	–0.31	–3.82	0.57
Mining of mineral resources	1.20	0.52	0.63	–0.01	–0.03	0.15
Industry	0.84	22.18	18.92	–0.57	–2.42	–0.56
Wholesale and retail trade	1.32	11.51	15.40	–0.29	2.41	1.53
Financial activity	1.35	1.08	1.49	–0.03	0.21	0.20
Services	1.03	52.48	54.76	–1.34	2.30	0.46

Table 2. (Contd.)

Region/ Economic sector	Changes in 2009 compared to 2005, index	Share of the sector in the number of employed in the regional economy		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Ivanovo oblast						
Total	**0.89**	**100**	**100**	**–2.56**	**–1.74**	**–7.66**
Agriculture	0.60	6.17	4.12	–0.16	–1.93	–0.39
Mining of mineral resources	1.01	0.28	0.32	–0.01	–0.02	0.03
Industry	0.71	34.03	27.12	–0.87	–3.72	–5.18
Wholesale and retail trade	1.18	6.82	8.97	–0.17	1.43	–0.04
Financial activity	1.15	1.21	1.56	–0.03	0.23	–1.41
Services	1.01	51.50	57.91	–1.32	2.26	–0.66
Kaluga oblast						
Total	**0.98**	**100**	**100**	**–2.56**	**–1.51**	**0.38**
Agriculture	0.78	6.98	5.54	–0.18	–2.18	0.80
Mining of mineral resources	0.83	0.58	0.49	–0.01	–0.04	–0.05
Industry	0.93	31.16	29.52	–0.80	–3.40	1.93
Wholesale and retail trade	1.15	7.21	8.48	–0.18	1.51	–0.23
Financial activity	1.02	1.54	1.60	–0.04	0.30	–1.80
Services	1.01	52.53	54.37	–1.34	2.31	–0.28
Kostroma oblast						
Total	**1.02**	**100**	**100**	**–2.56**	**–2.14**	**6.27**
Agriculture	0.74	11.15	8.15	–0.29	–3.49	0.89
Mining of mineral resources	0.90	0.19	0.16	0	–0.01	0
Industry	0.93	22.94	20.96	–0.59	–2.50	1.44
Wholesale and retail trade	1.76	4.56	7.92	–0.12	0.95	2.65
Financial activity	1.17	1.51	1.73	–0.04	0.29	0.00
Services	1.04	59.65	61.07	–1.53	2.62	1.29
Kursk oblast						
Total	**0.92**	**100**	**100**	**–2.56**	**–3.30**	**–2.53**
Agriculture	0.50	13.95	7.69	–0.36	–4.36	–2.19
Mining of mineral resources	0.79	2.27	1.96	–0.06	–0.15	–0.27
Industry	0.84	24.04	22.04	–0.62	–2.62	–0.61
Wholesale and retail trade	1.26	6.34	8.73	–0.16	1.33	0.49
Financial activity	1.20	1.13	1.49	–0.03	0.22	0.04
Services	1.02	52.27	58.10	–1.34	2.29	0.00
Lipetsk oblast						
Total	**0.97**	**100**	**100**	**–2.56**	**–1.29**	**0.95**
Agriculture	0.73	10.92	8.25	–0.28	–3.41	0.78
Mining of mineral resources	1.01	0.79	0.83	–0.02	–0.05	0.08
Industry	0.80	19.80	16.28	–0.51	–2.16	–1.33
Wholesale and retail trade	1.48	6.82	10.40	–0.17	1.43	2.03
Financial activity	1.24	1.32	1.70	–0.03	0.25	0.10
Services	1.01	60.35	62.54	–1.54	2.65	–0.72
Moscow oblast						
Total	**1.06**	**100**	**100**	**–2.56**	**0.69**	**7.70**
Agriculture	0.74	3.44	2.40	–0.09	–1.07	0.27
Mining of mineral resources	0.77	0.30	0.21	–0.01	–0.02	–0.04
Industry	0.93	28.04	24.68	–0.72	–3.06	1.86
Wholesale and retail trade	1.30	10.28	12.60	–0.26	2.15	1.16
Financial activity	1.09	0.99	1.02	–0.03	0.19	–0.08
Services	1.10	56.94	59.08	–1.46	2.50	4.54

Table 2. (Contd.)

Region/ Economic sector	Changes in 2009 compared to 2005, index	Share of the sector in the number of employed in the regional economy		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Orel oblast						
Total	**0.90**	**100**	**100**	**–2.56**	**–2.42**	**–5.22**
Agriculture	0.60	13.03	8.71	–0.33	–4.07	–0.81
Mining of mineral resources	0.74	0.10	0.08	0	–0.01	–0.02
Industry	0.79	24.33	21.34	–0.62	–2.66	–1.89
Wholesale and retail trade	1.07	8.04	9.55	–0.21	1.68	–0.94
Financial activity	1.09	1.59	1.92	–0.04	0.30	–0.12
Services	0.99	52.91	58.39	–1.35	2.32	–1.45
Ryazan oblast						
Total	**0.94**	**100**	**100**	**–2.56**	**–1.61**	**–1.80**
Agriculture	0.57	9.98	6.01	–0.26	–3.12	–0.95
Mining of mineral resources	0.74	0.58	0.46	–0.01	–0.04	–0.10
Industry	0.92	25.35	24.86	–0.65	–2.77	1.44
Wholesale and retail trade	1.22	7.82	10.11	–0.20	1.64	0.25
Financial activity	1.05	1.39	1.55	–0.04	0.27	–0.16
Services	0.98	54.88	57.01	–1.40	2.41	–2.28
Smolensk oblast						
Total	**0.99**	**100**	**100**	**–2.56**	**–1.70**	**2.02**
Agriculture	0.76	7.64	5.81	–0.20	–2.39	0.72
Mining of mineral resources	0.97	0.55	0.54	–0.01	–0.04	0.03
Industry	0.90	29.75	26.93	–0.76	–3.25	0.99
Wholesale and retail trade	1.34	6.50	8.75	–0.17	1.36	1.00
Financial activity	1.3	1.18	1.53	–0.03	0.23	–1.37
Services	1.03	54.39	56.44	–1.39	2.39	0.65
Tambov oblast						
Total	**0.92**	**100**	**100**	**–2.56**	**–2.56**	**–3.03**
Agriculture	0.61	13.27	8.82	–0.34	–4.15	–0.69
Mining of mineral resources	1.52	0.03	0.05	0	0	0.02
Industry	0.84	22.08	20.15	–0.57	–2.41	–0.60
Wholesale and retail trade	1.26	5.85	8.06	–0.15	1.23	0.47
Financial activity	1.02	1.29	1.43	–0.03	0.25	–0.19
Services	0.98	57.48	61.50	–1.47	2.52	–2.05
Tver oblast						
Total	**0.91**	**100**	**100**	**–2.56**	**–2.24**	**–4.59**
Agriculture	0.63	9.38	6.55	–0.24	–2.93	–0.27
Mining of mineral resources	1.12	0.20	0.24	–0.01	–0.01	0.04
Industry	0.81	30.14	26.88	–0.77	–3.29	–1.72
Wholesale and retail trade	1.04	6.96	8.00	–0.18	1.46	–1.00
Financial activity	1.13	1.31	1.63	–0.03	0.25	–0.05
Services	0.99	52.01	56.70	–1.33	2.28	–1.60
Tula oblast						
Total	**0.96**	**100**	**100**	**–2.56**	**–1.18**	**–0.57**
Agriculture	0.61	5.64	3.59	–0.14	–1.76	–0.30
Mining of mineral resources	0.82	0.53	0.45	–0.01	–0.04	–0.05
Industry	0.86	32.32	29.17	–0.83	–3.53	–0.05
Wholesale and retail trade	1.13	7.50	8.81	–0.19	1.57	–0.44
Financial activity	1.09	1.41	1.61	–0.04	0.27	–0.11
Services	1.03	52.61	56.37	–1.35	2.31	0.37

Table 2. (Contd.)

Region/ Economic sector	Changes in 2009 compared to 2005, index	Share of the sector in the number of employed in the regional economy		Effect of (index)		
		2005	2009	national factors	regional factors	internal efficiency of the economic sector
1	2	3	4	5	6	7
Yaroslavl oblast						
Total	**0.98**	**100**	**100**	**–2.56**	**–0.89**	**1.12**
Agriculture	0.69	5.83	4.14	–0.15	–1.82	0.18
Mining of mineral resources	0.66	0.32	0.22	–0.01	–0.02	–0.08
Industry	0.86	30.06	26.50	–0.77	–3.28	–0.13
Wholesale and retail trade	1.31	7.47	9.99	–0.19	1.56	0.91
Financial activity	1.08	1.34	1.47	–0.03	0.26	–0.12
Services	1.02	54.98	57.68	–1.41	2.41	0.35
Moscow						
Total	**1.02**	**100**	**100**	**–2.56**	**5.69**	**–0.78**
Agriculture	0.28	0.29	0.08	–0.01	–0.09	–0.11
Mining of mineral resources	0	0.04	0.02	0	0	–0.03
Industry	0.87	14.44	12.28	–0.37	–1.58	0.08
Wholesale and retail trade	1.20	18.14	21.21	–0.46	3.80	0.24
Financial activity	1.14	4.14	4.62	–0.11	0.79	–0.10
Services	1.00	62.95	61.78	–1.61	2.76	–0.86

the ternary sector of the economy is positive in all regions of the CFD.

The share of employed in agriculture in the total number of employed in 12 regions of the district exceeds the country's mean level, which confirms the assumption about the considerable agricultural sector in the regions. Those regions are leaders by this parameter, which are leading in respect of the share in GRP. The number of employed in agriculture decreased in the analyzed period in all regions of the district. Agriculture developed in half of the regions due to the high internal efficiency. As mentioned earlier, the effect of national and regional factors of development is negative.

The mining industry has only a significant presence in Belgorod and Kursk oblasts, the share of employed in the mining industry is twice as large in Belgorod as in Kursk. In addition, Belgorod oblast is the only one that has positive development dynamics (an increase in the number of employed by 34% in the analyzed period, which is exceptionally due to the high internal efficiency). It once again proves the conclusion that the development of this sector of the economy in Belgorod oblast is a competitive advantage.

An increase in the number of employed in the manufacturing industry only occurred in Belgorod oblast (11%). The share of employed in the manufacturing industry exceeded the mean level of the country in 16 regions of the CFD. The situation observed in Lipetsk oblast is of interest. This oblast has the highest share of industry in GRP in the district, and the most significant increase in the volume of business occurred in the analyzed period; however, the share of employed in the industry was lower than Russia's mean level, and the number of employed decreased. This situation can be explained by either increased labor productivity in the industry or the effect of the foreign trade factor, and, therefore, an additional analysis is required.

The number of employed in wholesale and retailing increased in all regions of the CFD; however, the mean employment level in this sector of Russia's economy was only exceeded in Voronezh and Moscow oblasts and Moscow.

According to the number of employed (in contrast to the contribution to GRP as mentioned above), the financial sector is present in all regions of the district. However, in no region, except for Moscow, the share of employed in financial activity exceeds the mean value for Russia. Nevertheless, the number of employed in this sector increased in the analyzed period in all regions, except for Bryansk oblast.

The service industry is significant in Russia in terms of the share of employed in the sector (60.52% in 2009). In the CFD, the country's mean level was only exceeded in Kostroma (61.07%) and Lipetsk (62.54%) oblasts and Moscow (61.78%). The number of employed in the service industry in the regions of the district remained practically unchanged in the analyzed period (an average increase of 2% occurred in the district).

GRAPHICAL ANALYSIS

We carry out a graphical analysis of the shift-share components in the regional economies of the CFD by decomposing the dynamics of GRP and the number of employed in the period of 2005–2009 (Fig. 2).

The service industry is illustrated in the top right-hand part of the graph for practically all regions of the CFD. In our opinion, it reflects the common postindustrialization trend in the economy. Branches with a high level of internal efficiency, the products of which are demanded at the national level (top left-hand sector of the graph), can become the region's competitive advantage. The following regions are leaders by GRP: Belgorod, Voronezh, Lipetsk, and Tambov oblasts in agriculture; Vladimir, Voronezh, Kaluga, and Kursk oblasts and Moscow in manufacturing; and many regions, except for Voronezh, Kaluga, Lipetsk, Ryazan, Tula, and Yaroslavl oblasts and Moscow, in wholesale and retail trade.

Shift-share analysis by the number of employed makes it possible to identify wholesale and retail trade, financial sector, and the service industry as efficiently developing branches in all regions of the CFD. The development of agriculture is stimulated by internal efficiency in nine regions and has prospects due to national growth factors. We consider that competitive advantages in the development of this sector of the economy are present in regions which have significant shares in GRP: Belgorod (9.83% in 2009), Voronezh (8.8%), Kostroma (8.15%), Lipetsk (8.25%), and Smolensk (5.81%) oblasts.

The mining industry develops due to internal efficiency in eight regions of the CFD. However, for seven of them (except for Belgorod oblast), the sector's share in GRP does not exceed 1%, which is strategically insignificant. A reduction in business activity (by 21%) occurred in Kursk oblast, where the share of mining in GRP was 1.96% in 2009, as a result of the negative influence of all three groups of factors.

The manufacturing industry develops due to internal efficiency in eight regions of the district. The following oblasts can be considered leading with the shares of their industries in the region's GRP taken into account: Belgorod (with a share of 22.55%, the effect of internal efficiency is 5.25), Kaluga (29.52% and 1.93, respectively), Kostroma (20.96% and 1.44), Moscow (24.68% and 1.86), Ryazan (24.86% and 1.44), and Smolensk (26.93% and 0.99).

The shift-share decomposition showed that the growth in the number of employed was due to internal efficiency in 12 regions of the CFD for the sector of wholesale and retail trade; in 4 regions, for financial activity; and in 7 regions, for services.

DETERMINATION OF REGIONAL COMPETITIVE ADVANTAGES

In order to determine the competitive advantages of sectors in the regional economy, the following parameters should be necessarily taken into account:

—the sector's share in the region's economy;

—dynamics of the sector's activity in the analyzed period;

—the effect of national and regional factors of development on the sector's dynamics;

—the sector's level of development due to internal efficiency;

—labor productivity in the sector;

—the export orientation level and the possible effect of foreign economic factors.

An increase in the activity level of any sector of the regional economy occurring due to increasing number of employed may be considered as growth due to extensive factors. Otherwise, a positive effect of growth in labor productivity on GRP can be stated. We consider that the methodology of shift-share analysis makes it possible to identify the competitive sectors of the regional economy by productivity. In this case, it is important to consider that the most competitive sectors of the economy are often export-oriented. Therefore, the volume of output is not only affected by internal factors, but also by foreign economic ones, such as dynamics of global prices.

GDP growth in Russia (on the whole, by 7% in the analyzed period) accompanied by a reduction in the number of employed in the economy (by 3%) is, first of all, explained by labor productivity growth (because the effect of the inflation factor was excluded through presenting gross product values at comparable prices). The labor productivity growth in agriculture (by 52% in 2005–2009) is the most illustrative. When the number of employed in the sector of the economy was reduced by 34%, the volume of output increased by 1%. In addition to agriculture, labor productivity growth in the Russian economy was only observed in industry (by 18%). Reductions in labor productivity occurred in the rest of the economy's sectors (by 11% in mining of mineral resources, by 24% in wholesale and retail trade, by 50% in the financial sector, and by 1% in services).

We consider the effect of productivity on the shift-shares of the CFD regions in more detail.

The share of employed decreased in the district's agriculture from 7.19% in 2005 to 4.89% in 2009. The share of employed in agriculture as of 2009 exceeded the mean value for Russia in 12 regions. Agribusiness

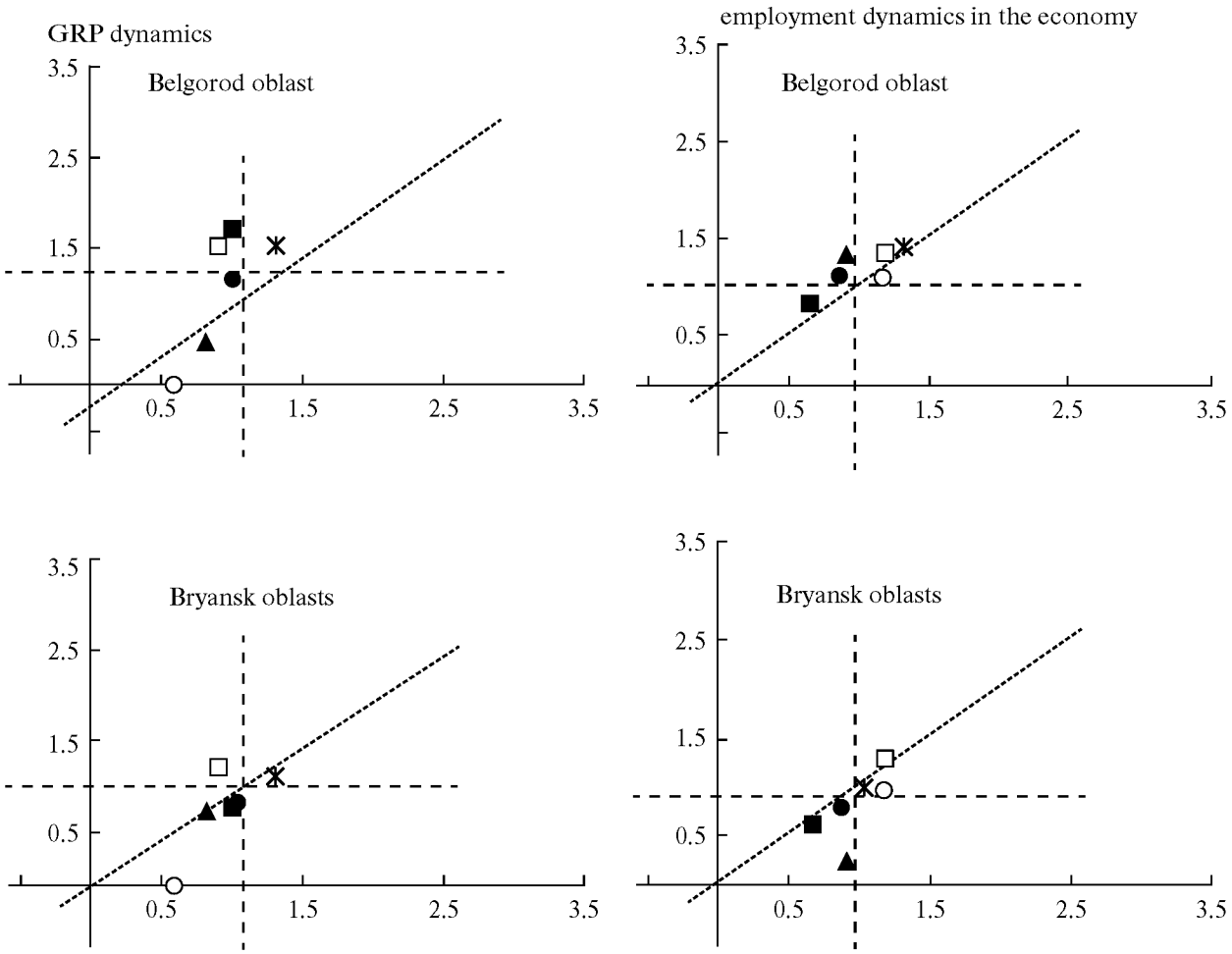

Fig. 2. Results of a graphical analysis of the shift-share decomposition in the economies of the CFD regions in 2005–2009 (by GRP and the number of employed).

GRP dynamics;

employment dynamics in the economy;

Growth index of the economic sector

■ – Agriculture

▲ – Mining of mineral resources

● – Industry

□ – Wholesale and retail trade

✱ – Services

○ – Financial activity

The horizontal dotted line represents the growth index of the regional economy;

The vertical dotted line represents the growth index of the national economy.

is developed most in eight regions: the Central Black Earth region and Orel, Ryazan, and Kostroma oblasts[4].

It is remarkable that the number of employed in agriculture and their share in the overall number of employed in the economy decreased in all CFD regions. An increase in the volume of output does not only occur due to growth in productivity: it can also be caused by growth in foreign prices for agricultural products. We consider that a necessity to exclude the effect of the foreign trade factor arises in this case.

We carry out a more detailed factor analysis of agricultural development in the eight aforementioned regions (Table 3). A certain amount of products pro-

[4] The largest share of agriculture in the economy was peculiar in 2009 for Belgorod (16.3% in GRP and 9.83% in the number of employed), Tambov (15.6 and 8.82%), Voronezh (11.8 and 8.8%), Orel (13.2 and 8.71%), Kostroma (11.8 and 8.15%), and Kursk (13.2 and 7.69%) oblasts. Lipetsk and Ryazan oblasts have large shares of agriculture by one parameter (in Lipetsk oblast, the share of employed in agriculture was 8.25%, and in Ryazan oblast, the share of agriculture in GRP was 11.6%).

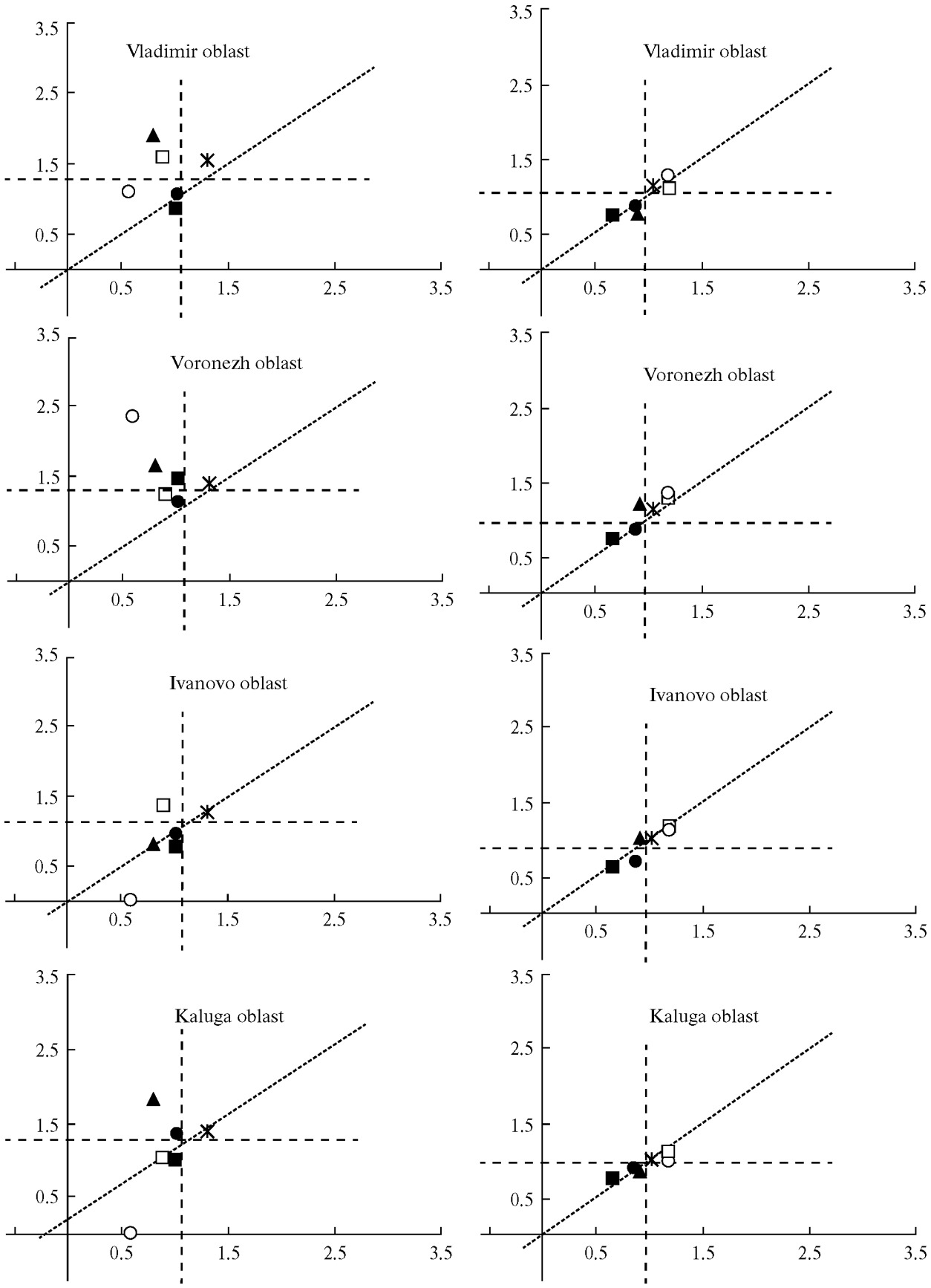
Vladimir oblast
Vladimir oblast
Voronezh oblast
Voronezh oblast
Ivanovo oblast
Ivanovo oblast
Kaluga oblast
Kaluga oblast
3.5
2.5
1.5
0.5
0.5
1.5
2.5
3.5

Fig. 2. (Contd.)

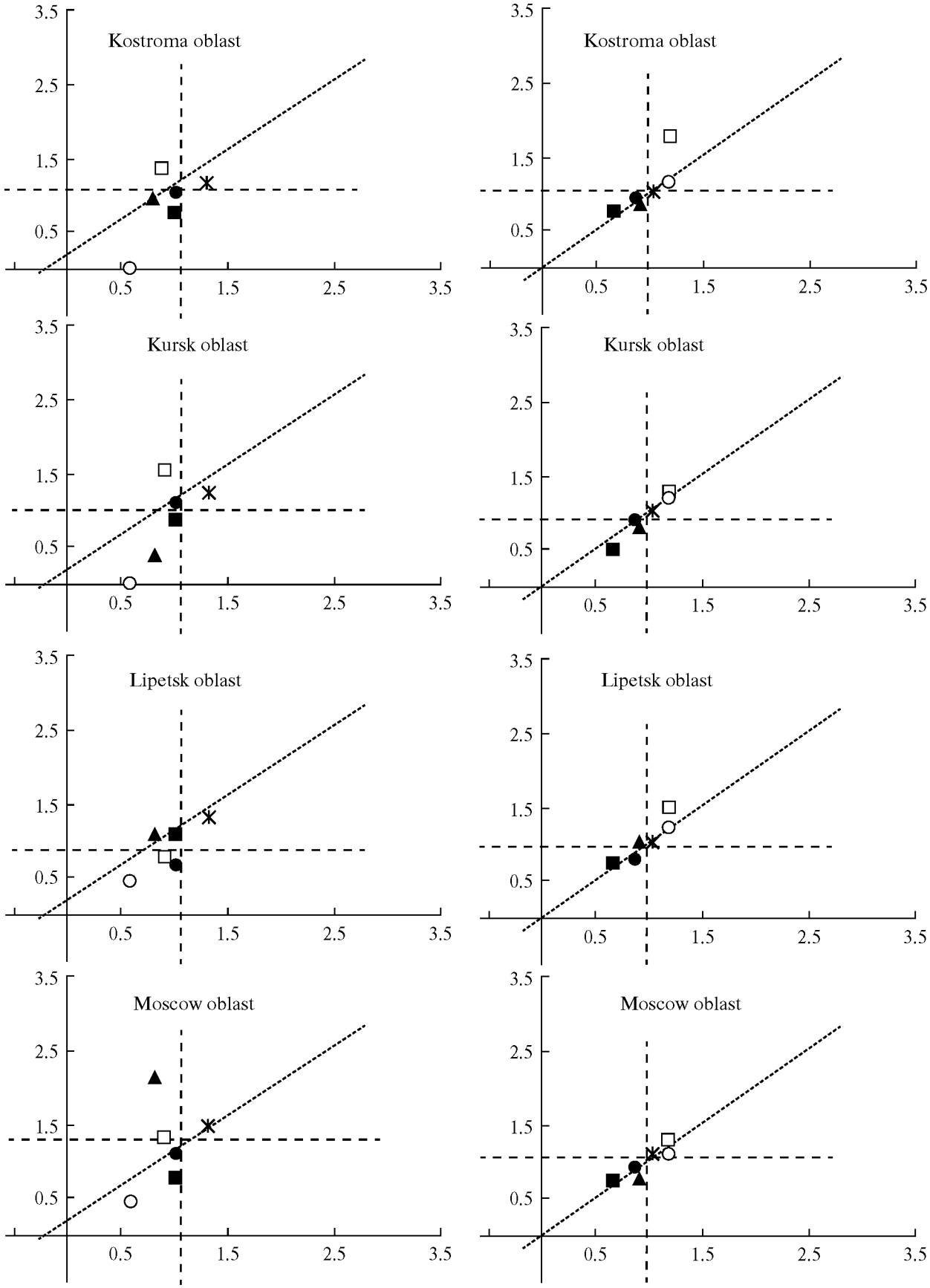
Kostroma oblast
Kostroma oblast
Kursk oblast
Kursk oblast
Lipetsk oblast
Lipetsk oblast
Moscow oblast
Moscow oblast
3.5
2.5
1.5
0.5
0.5
1.5
2.5
3.5

Fig. 2. (Contd.)

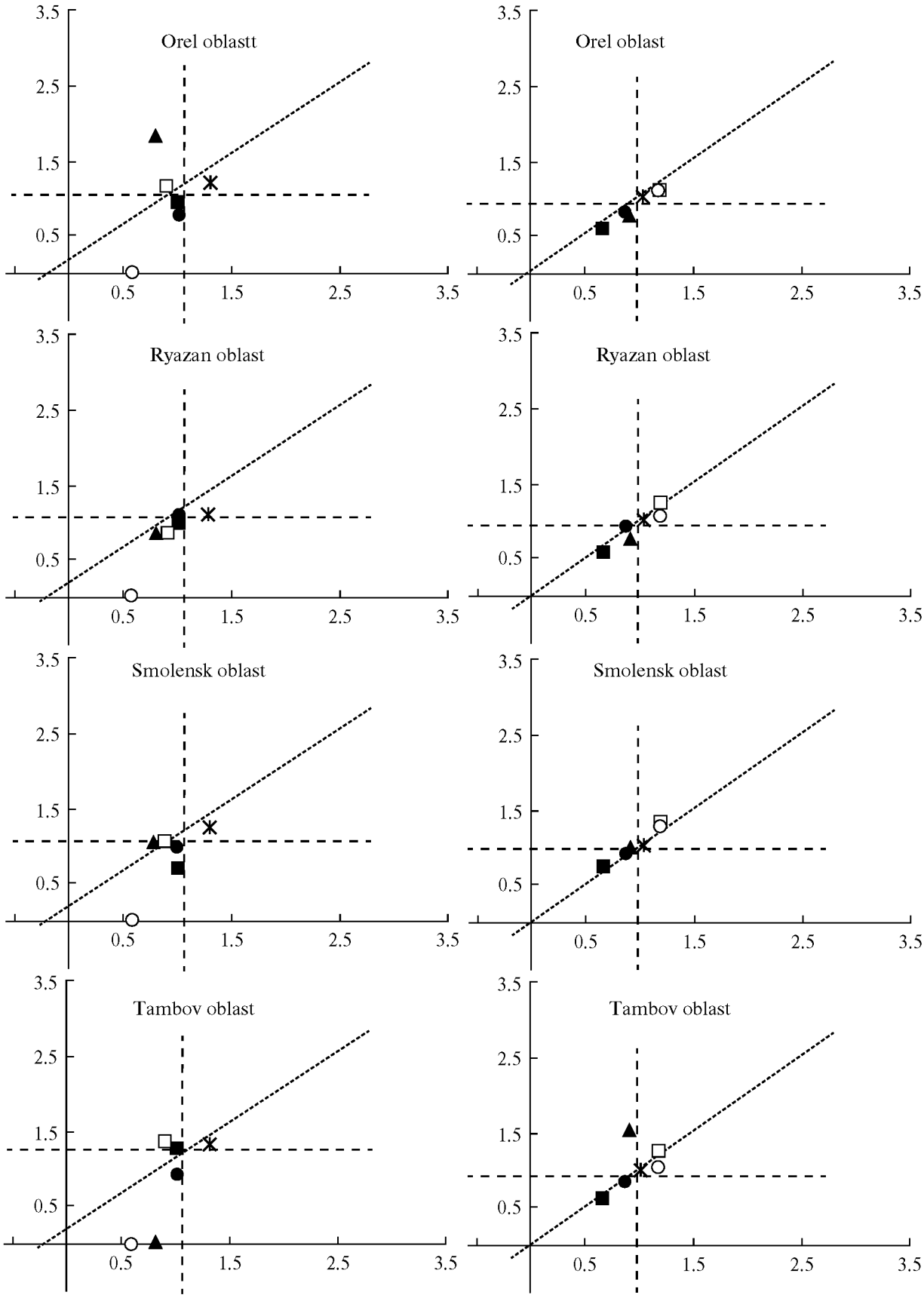
Orel oblastt
Orel oblast
Ryazan oblast
Ryazan oblast
Smolensk oblast
Smolensk oblast
Tambov oblast
Tambov oblast
3.5
2.5
1.5
0.5
0.5
1.5
2.5
3.5

Fig. 2. (Contd.)

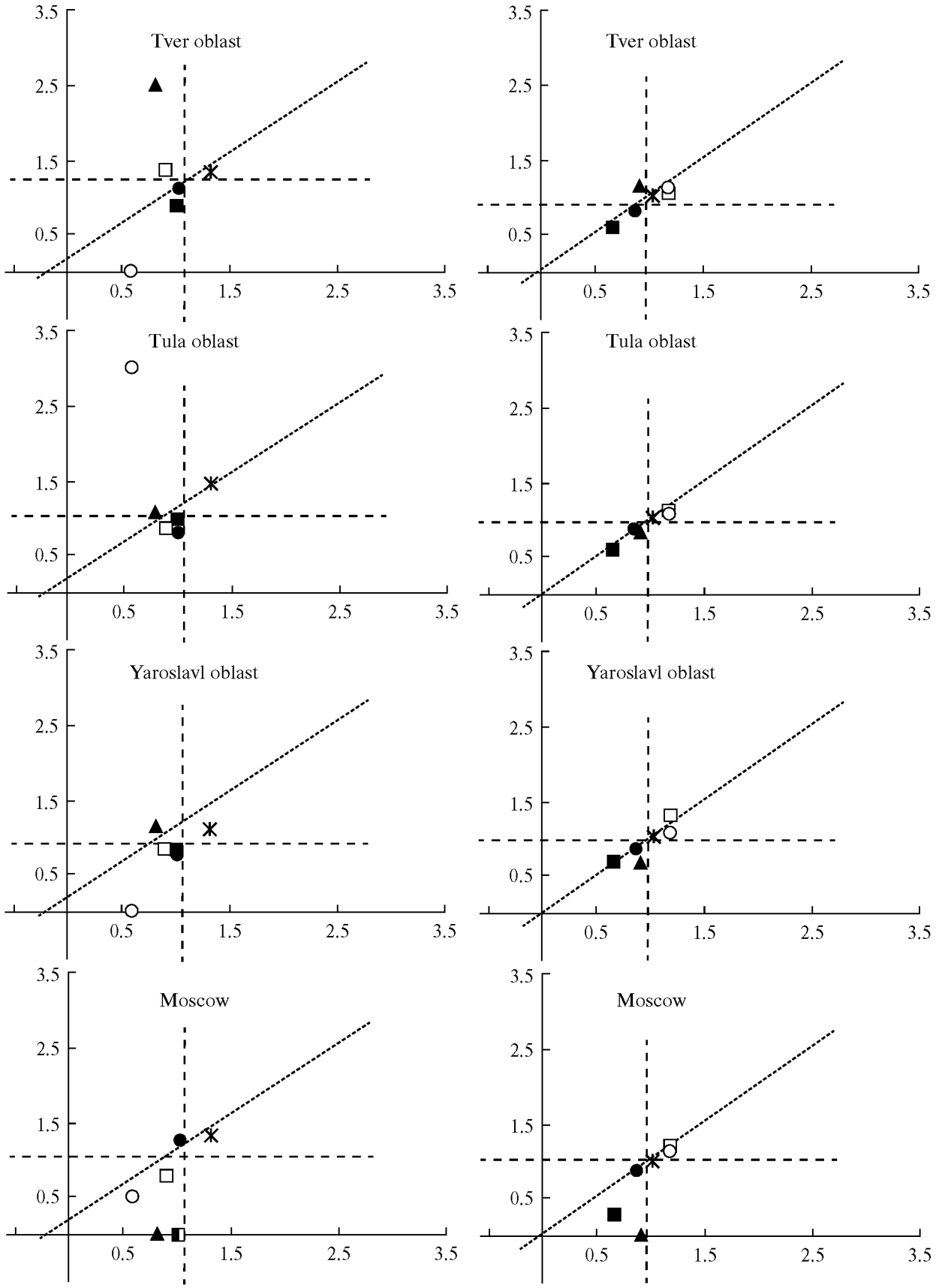
Tver oblast
Tver oblast
Tula oblast
Tula oblast
Yaroslavl oblast
Yaroslavl oblast
Moscow
Moscow
3.5
2.5
1.5
0.5
0.5
1.5
2.5
3.5

Fig. 2. (Contd.)

Table 3. Main adjustment parameters of labor productivity in agriculture, considering the effect of global prices in certain regions of the CFD in 2005–2009

Region	Index of output volume	Employment index	Labor productivity index	Export of food products and agricultural raw materials in 2009, mln USD	Adjusted index of output volume	Adjusted index of labor productivity
Russian Federation	1.07	0.97	1.52	9953.5	1.06	1.43
Belgorod oblast	1.72	1.04	2.11	130.9	1.65	2.02
Voronezh oblast	1.48	0.98	2.08	61.2	1.43	2.02
Kostroma oblast	0.74	1.02	1	2.6	0.74	1
Kursk oblast	0.89	0.92	1.75	31.6	0.86	1.71
Lipetsk oblast	1.11	0.97	1.52	57.1	1.06	1.45
Orel oblast	0.95	0.9	1.58	54	0.88	1.47
Ryazan oblast	1.77	0.94	1.11	3.1	1	1.11
Tambov oblast	1.26	0.92	2.06	10	1.25	2.04

Note: @.

duced in the above-mentioned regions has foreign trade nature, and, therefore, the development of this economic sector depends on global market conditions. According to the data of the World Trade Organization, the increase in prices for agricultural products on the global market was 40% in 2009 in comparison with 2005 [9, p. 236].

The actual labor productivity index in the regions under study fell slightly (Kostroma oblast, where exports of agricultural products are insignificant, is an exception). The maximum change in the productivity index of agriculture was observed in regions with high export quotas for food products and agricultural raw materials (24.53% for Orel, 16.33% for Lipetsk, and 14.91% for Belgorod).

In order to determine the regions, in which agricultural development is a competitive advantage, we carry out a graphical analysis of the dynamics of this economic sector affected by three factor groups: national and regional factors and internal efficiency of agriculture (Fig. 3).

The three groups of factors have a positive effect on agricultural development in seven regions (except for Kostroma oblast). Therefore, we can determine agricultural development in Belgorod, Voronezh, Kursk, Lipetsk, Orel, Ryazan, and Tambov oblasts as their economies' competitive advantage.

A rather strong effect of the foreign trade factor can be seen in the mining industry (similarly to agriculture). As it was mentioned above, the mining industry can only be considered a competitive advantage in Belgorod oblast among all CFD regions. However, the labor productivity in the mining industry in the region has fallen by 25% since 2005, which, in our opinion, is a direct result of the effect of the foreign economic factor. Belgorod oblast is one of the largest Russian exporters of products of the mining and metal complex, i.e., iron ore raw materials and iron. Thus, the region's exports in the category "Metals and Metal Items" was 1260.8 million USD in 2009 or 71.56% of the whole region's exports. World prices for iron ore increased by 56% in the analyzed period (2005–2009) (Fig. 4).

A constant growth in global prices for iron ore has been observed since 2002. It, in turn, stimulated the development of the mining and metal complex in Belgorod oblast, expansion of production, increase in mining volumes, and, therefore, creation of new jobs, resulting in an increase in the number of employed. The economic crisis caused a decline in demand for iron ore raw materials and iron. The decrease in the activity of the mining industry in Belgorod oblast did not result in a corresponding reduction in the number of employed, because the enterprises of this sector are among the largest (and even city-forming) ones. Therefore, the labor productivity decreased. Thus, the mining branch in Belgorod oblast can be quite nominally considered a competitive advantage, because it strongly depends on the foreign trade factor and enterprises are unable to quickly react to changes in market conditions. Vladimir, Kaluga, Kostroma, Kursk, Lipetsk, Ryazan, Smolensk, Tula, and Yaroslavl oblasts can be considered industrial regions based on the sector's share in GRP. The share of employed in industry in the overall number of employed in the economy in these regions exceeds the mean value for Russia[5]. Positive dynamics of output is observed in Vladimir, Kaluga, Kostroma, Kursk, and Ryazan

[5] Lipetsk oblast is an exception: although its contribution to GRP is 46.2%, its share in the overall number of employed is only 16.28%.

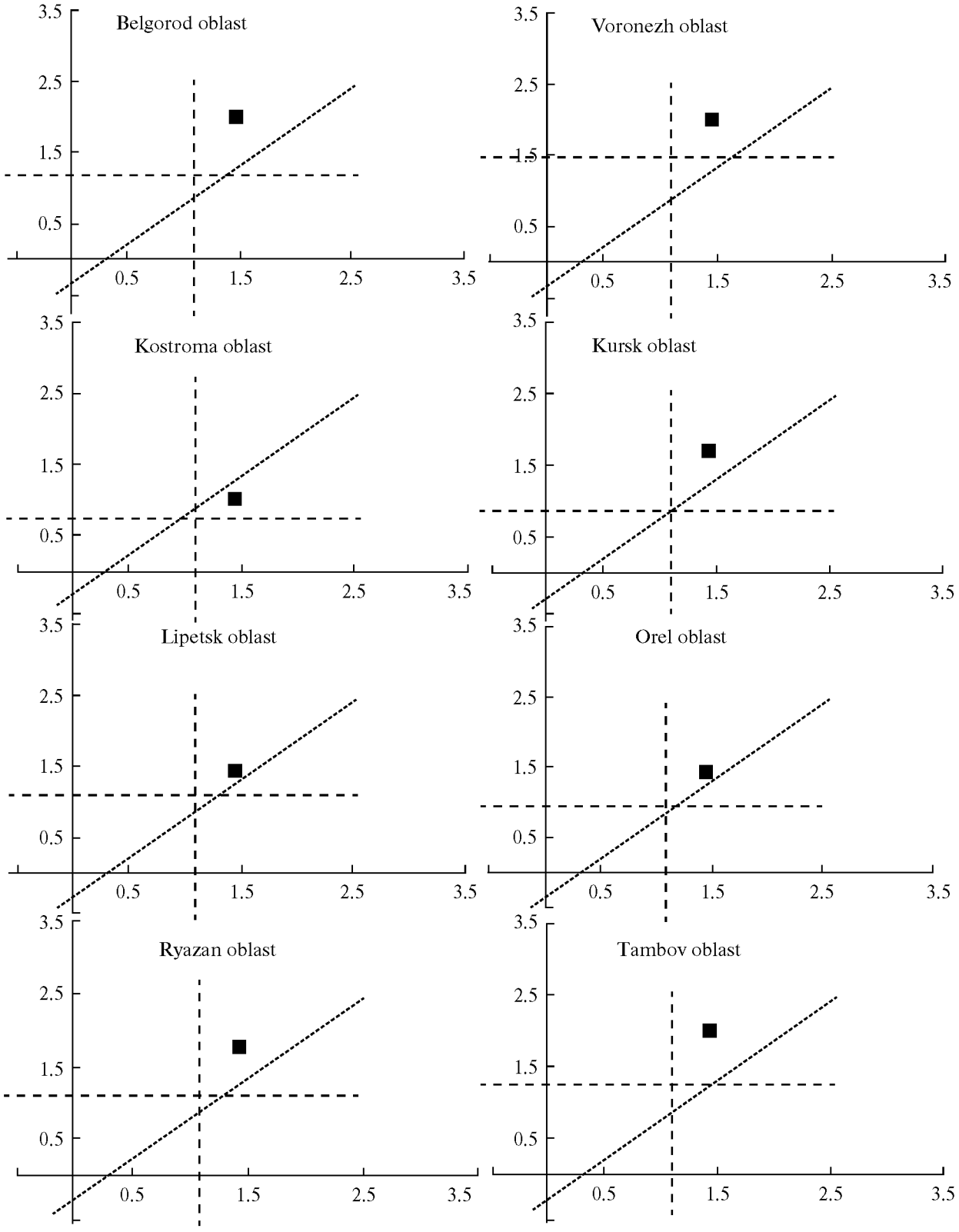

Fig. 3. Results of a graphical analysis of the dynamics of agricultural development in several CFD regions in 2005–2009 affected by national and regional factors and the sector's internal efficiency.

■ – Agriculture (the index is adjusted with allowance for the dynamics of global prices).

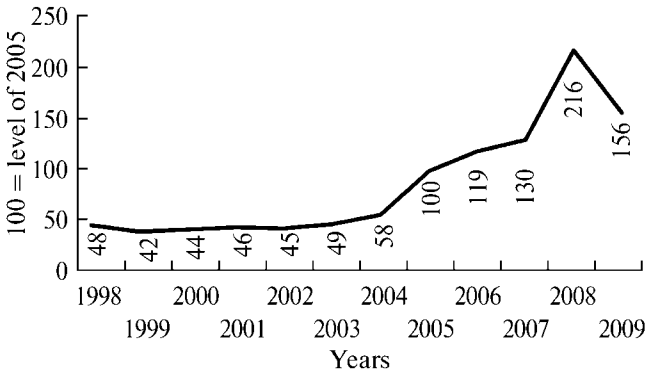

Fig. 4. Dynamics of global prices for iron ore in 1998–2009 (Composed based on the data from [9, p. 236]).

oblasts; the number of employed in the branch decreases in all regions. In order to determine the regions, in which the manufacturing industry is a competitive advantage, we consider the formation of economic growth in industry in the aforementioned nine CFD regions in more detail (Table 4).

Internal industrial efficiency is observed in Vladimir, Kaluga, Kostroma, Kursk, Ryazan, and Smolensk oblasts. We also find it necessary to consider the possibility of classifying the industrial sector as a competitive advantage of Lipetsk oblast (due to its high labor productivity). The results of the graphical shift-share analysis in the industrial sector of the listed regions are presented in Fig. 5.

The manufacturing industry is located in the top right-hand sector for Kaluga, Kostroma, Kursk, and Ryazan oblasts. We consider that the manufacturing industry's branches are not only efficient in these regions, but are also important at regional and national levels. Their further development will lead to an increase in the overall competitiveness of the listed regions. In Vladimir and Smolensk oblasts, there is a potential for efficient industrial development, whereas in Lipetsk oblast, the labor productivity decreases and the industry stops being a competitive advantage of the region's economy.

Wholesale and retail trade can be a competitive advantage in Bryansk, Voronezh, Moscow, Smolensk, and Tambov oblasts and Moscow (based on the sector's share in GRP and the number of employed). The development of trade is stimulated in these regions by the effect of the national and regional economies, as well as internal efficiency. The largest labor productivity levels in trade were registered in Tambov (851200 rubles per capita), Moscow (753400 rubles), and Smolensk (505400 rubles) oblasts and Moscow (1.4789 million rubles). Growth in labor productivity is only observed in Moscow (growth rate of 1.02 in 2005–2009) and Tambov (1.09) oblasts.

The financial sector is present in six regions: Vladimir (the share in GRP was 1.9% in 2009), Voronezh (0.5%), Lipetsk (0.1%), Moscow (0.7%), and Tula (0.3%) oblasts and Moscow (1.7%). It is remarkable that, when a shift-share decomposition by the number of employed is carried out, the financial sector is located in the top right-hand sector for all regions of the district, which, in our opinion, shows the flexibility of this field of the economy. The competitiveness of the financial sector is mostly provided by national development factors in Vladimir oblast. Internal efficiency supplemented by national factors is the main stimulus of development of financial activity in Voron-

Table 4. Several parameters of industrial development in several regions of the CFD in 2005–2009

Oblast	Effect of factors on the dynamics of activity			Effect of factors on the dynamics of employment			Labor productivity		Exports*
	National factors	Regional factors	Efficiency	National factors	Regional factors	Efficiency	Total, thous rubles/person	Changes in 2009 compared to 2005	
Vladimir oblast	+	–	+	–	–	–	249.9	1.27	267.8
Kaluga oblast	+	–	+	–	–	+	318.7	1.47	146.6
Kostroma oblast	+	–	+	–	–	+	325.5	1.12	21.7
Kursk oblast	+	–	+	–	–	–	373.5	1.31	67.8
Lipetsk oblast	+	–	–	–	–	–	1111	0.89	100.9
Ryazan oblast	+	–	+	–	–	+	307.7	1.18	56.4
Smolensk oblast	+	–	–	–	–	+	241.1	1.07	257.9
Tula oblast	+	–	–	–	–	–	289.9	0.94	833.4
Yaroslavl oblast	+	–	–	–	–	–	303.2	0.88	236.3

* Exports by the product categories "Chemical Industry Products and Rubber" and "Machines, Equipment, and Transport Means."

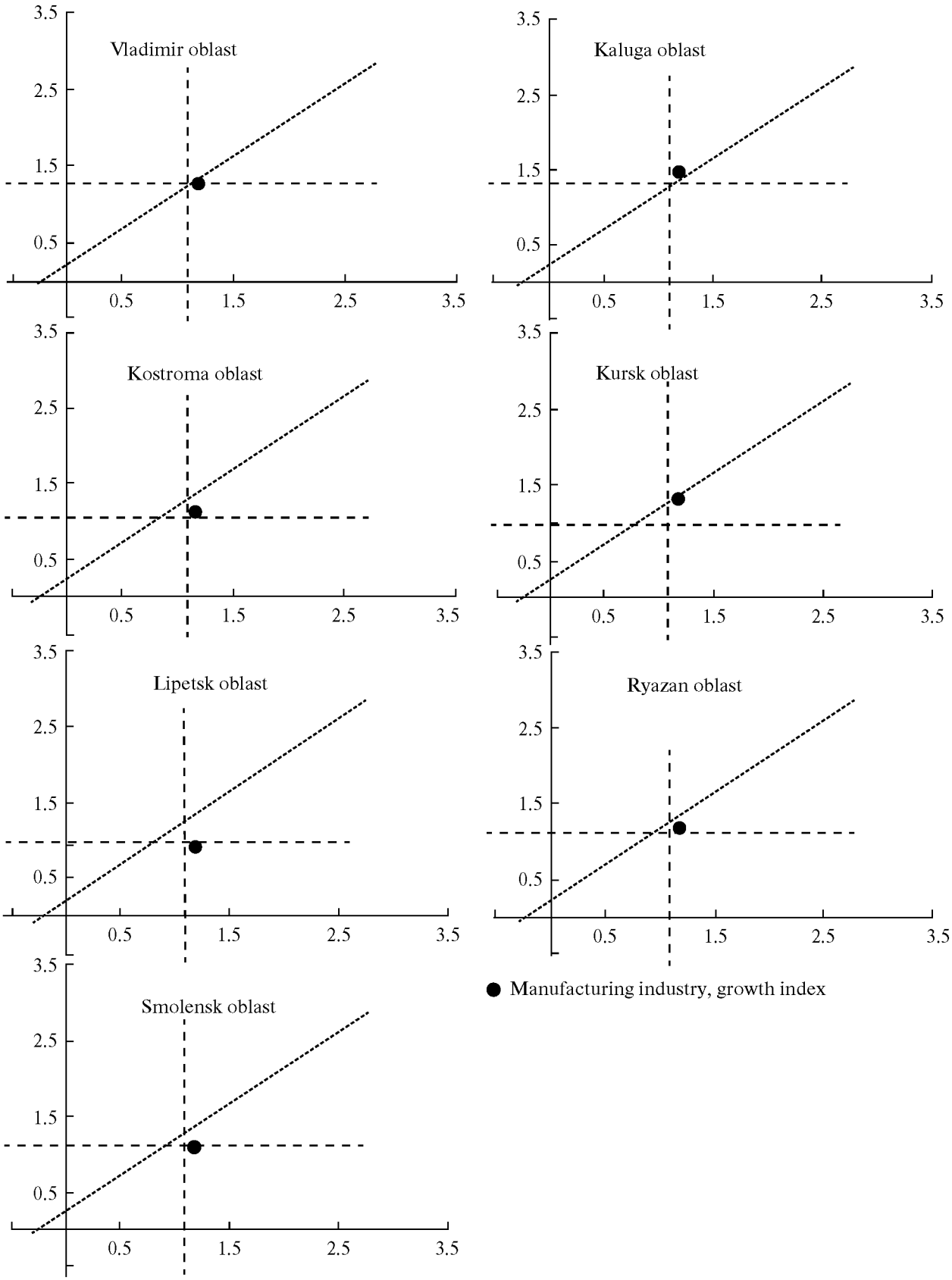

Fig. 5. Results of a graphical analysis of the dynamics of the manufacturing industry's development in several CFD regions in 2005–2009 affected by national and regional factors and the sector's internal efficiency.
● – Manufacturing industry, growth index.

ezh and Tula oblasts. Financial activity is among outsider economic branches in Lipetsk and Moscow oblasts and Moscow.

The service industry develops most efficiently in CFD regions: it is located in the top right-hand sector in the graphs of shift-share decomposition by GRP dynamics and the number of employed in the economy. The mean Russian indicators of the service industry's share in GRP and the number of employed are exceeded in 12 regions of the district[6]. The shift-share analysis by GRP showed that the effect of national and regional development factors in these regions is positive. Branch internal efficiency is observed in Voronezh, Moscow, Tver, Tula, Lipetsk, and Tambov oblasts and Moscow.

A negative effect of national and a positive effect of regional development factors in the service industry (relying upon the shift-share analysis by the number of employed in the economy) are observed in all CFD regions. Internal efficiency is observed in Voronezh, Moscow, Tula, Yaroslavl, and Kostroma oblasts. If the district's regions, in which the development of the service industry is provided by internal efficiency, are considered, positive dynamics of labor productivity is observed in Voronezh (labor productivity of 204000 rubles per capita and a growth index of 1.07), Moscow (377800 rubles and 1.08), Tver (258200 rubles and 1.02), Tula (215600 rubles and 1.1), Tambov (191600 rubles and 1.01) oblasts and Moscow (726300 rubles and 1.06).

CONCLUSIONS

The use of the methodology of shift-share analysis in the evaluation of the economic results of CFD regions made it possible to determine the most competitive branches and the effects of external conditions and stimuli on the development of a regional economy.

Central Black Earth regions, Orel, and Ryazan oblasts have competitive advantages in agriculture. The sector of mineral resource mining is only an advantage in Belgorod oblast. This sector strongly depends on global market conditions, which, on the whole, causes vulnerability of the region's economy.

The manufacturing industry's branches are unconditional competitive advantages in Kaluga, Kostroma, Kursk, and Ryazan oblasts (they have high efficiencies there, and their development is supported by demand from the national and regional economies). The manufacturing industry can become a competitive advantage in Vladimir and Smolensk oblasts, and it has a potential for further development. In Lipetsk oblast, where the highest labor productivity is observed in other fields, this economic sector stops being a competitive advantage.

Competitive advantages in the wholesale and retail sector are discovered in Tambov, Moscow, and Smolensk oblasts and Moscow. In Vladimir oblast, the development of the financial sector of the economy as a competitive advantage is determined by national factors, whereas in Voronezh and Tula oblasts, it is also supplemented by internal efficiency. The service industry, which develops rather efficiently in all CFD regions, is a competitive advantage in Voronezh, Moscow, Tver, Tula, and Tambov oblasts and Moscow.

[6] The share of the service industry in GRP is the following: Bryansk (48.4%), Voronezh (45.3%), Ivanovo (52.9%), Moscow (48.9%), Orel (48.6%), Tver (49.6%), Tula (46%), and Yaroslavl (51.1%) oblasts. The share of the service industry in the overall number of employed in the economy is as follows: Kostroma (61.07%), Lipetsk (62.54%), and Tambov (61.5%). The share of the service industry in GRP is 47.2% in Moscow and 61.78% in the overall number of employed in the economy.

SPELL: 1. postcrisis, 2. infrastructural, 3. Prentice

REFERENCES

1. Limonov, L.E. and Rastvortseva, S.N., Evaluating the Effectiveness of the Competitive Advantages of the Regional Economy: A Shift-Share Analysis, *Finansy i Biznes*, 2010, no. 1, pp. 35–46.
2. *Regiony Rossii. Sotsial'no-ekonomicheskie pokazateli, Stat. Sb., 2010* (Russian Regions, Social-Economic Indexes, Statistical Handbook, 2010), Moscow: Rosstat, 2010, 991 p.
3. Central Statistical Database of Federal Service of State Statistic. http://www.gks.ru/bgd/freå.
4. Barf, Richard, A. and Prentice, L., Knight, Dynamic 3 Shift-Share Analysis, *Growth and Change*, 1988, vol. 19(2), pp. 1–9.
5. Capello, R., *Regional Economics*, London: Routledge, 2007, pp. 92–101.
6. Fritz, O. and Streicher, G., Measuring Changes in Regional Competitiveness over Time. A Shift-Share Regression Exercise, *Working Papers 243*, WIFO Publications, 2005.
7. Gabe, T. M., Growth of Creative Occupations in U.S. Metropolitan Areas: A Shift-Share Analysis, *Growth and Change*, 2006, vol. 37, issue 3, pp. 396–415
8. Houston, David, B., The Shift and Share Analysis of Regional Growth: A Critique, *Southern Economic Journal*, 1967, vol. 33 (4), 1967, pp. 577–581.
9. International Trade Statistics 2009, World Trade Organization. Switzerland. http://www.wto.org/english/res_e/statis_e/its2009_e/its09_toc_e.htm.
10. Perloff, H., Dunn, E., Lampard, E., and Muth, R., *Regions, Resources and Economic Growth*, Baltimore: John Hopkins, 1960.
11. Ray, M.A. and Harvey, J.T., Employment Changes in the European Economic Community: a Shift-Share Analysis, *Review of Regional Studies*, 1995, vol. 25, no.1, pp. 97–110.
12. Seyfried, W., Examining the Economic Competitiveness of the Economies of the Southern United States, University of Central Arkansas, 1996. http://www.westga.edu/~bquest/1996/seyfried.html.