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**THE CONCENTRATION ANALYSIS OF AGRICULTURAL SECTOR IN
TURKEY: ARE THERE ANY CHANGES IN THE PERIOD 2010 - 2015?**

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ABSTRACT

Despite the regional policies taken into agenda in all development plans in Turkey, inter-regional imbalances could not be resolved. Dynamics of the region must be examined in detail to resolve the inter-regional imbalance problems and in the light of these data differing policies should be developed in each specific region. Thus, detailed studies are needed on basis of regions and provinces. It is critically important to establish the priorities in agro-food production for utilizing the resources effectively and for competing against others like in Turkey whose agro-food sector is relatively dominant both in terms of population and employment. Therefore, it is aimed to determine the sectorial priorities in agriculture for using geographic concentration coefficient analysis in agricultural sub-sectors in Turkey. In this context, considering the Nomenclature of Territorial Units for Statistics (NUTS) - Level 2 (26 regions), the weight of employment structure of rural areas in Turkey will be analyzed for each region. Location coefficients will be calculated for each sector by comparing the population that is living in rural areas and working in agricultural, industrial and service sectors, with sector values of Turkey's rural areas. Later, agricultural sector will be analyzed on the basis of sub-sector for Level 2 regions. These analyses will be done for both 2010 and 2015 to compare the differences during this period. The reason of these diversities between mentioned time periods will be clarified by utilizing the agricultural policy applications in Turkey.

Keywords: *regional development, geographic concentration coefficient, location coefficient.*

INTRODUCTION

Inter-regional imbalances experienced today not only cause economic issues in the country but also affect global competitive strength negatively. In this context, countries worldwide have endeavored to eliminate inter-regional imbalances. However, this issue is considerably difficult for developing countries where financing needed for investments is limited. Regional development policies should

be produced based on regional dynamics so as to make undeveloped countries reach level of developed regions.

Although regional development concept has been in agenda since past, it has been intensively talked over during last twenty years. One reason for it are the changes occurred in regional development concept at first glance. While regional development has a predominant state view in past, recently it has changed to a market centered view. The solution based on provision of direct government income and from public source stated before for reduction of development deficit has now been replaced with necessity to use the resources owned by the regions at market conditions (Ercan, 2006).

What is expected from the government here is the adoption of legal regulations/legislations needed for such transformation and allocating incentives based on productivity principle rather than equality principle. The resources that are difficult to return in case of use in inefficient regions should be used in another region of the country efficiently, which may contribute to economy and growth of the country. This is a pre-condition for enhancing regional competitiveness and regional development (Aydemir, 2002),

Upon change addressing regional development, local economies and local actors have started to gain importance and SMEs with flexible and adaptive structures and new industries have started to emerge in parallel to increasing competition (Elvan et al., 2005). In this context, it is likely to say that in particular the efforts of international capital to shift production process to regions having relatively cheap workforce and raw material or increasing competitiveness by means of agreements with small and medium size enterprises performing activities in such regions have been effective. It is claimed that the changes in production process will serve for strengthening local economies and thus regional development (Ercan, 2006).

Agriculture sector, one of fundamental sectors, has not remained out of such developments. Particularly, upon high technology and bio-technology, agriculture sector not seen as high profit areas by developed countries in past has now been within interest of capital intensively today.

In countries like Turkey where rural regions and agriculture have an essential place in respect to population and employment, it is important to identify priorities for agriculture and food products in respect to effective use of resources as well as competitiveness. This study aims to analyze concentration of agriculture sector on basis of sub-sectors and establish sectoral priorities.

MATERIAL AND METHODS

This study analyses location coefficient of sectoral and geographical concentrations of regions, geographic concentration coefficient, concentration coefficient and concentration rate. In this context, statistical regional classification Level 2 regions (26 regions) were studied. Population living in rural areas and engaged in agricultural, industrial, trade and service sectors in the said regions were compared to the sectoral values of other rural areas in Turkey and location coefficients were

calculated for all sectors. Location coefficient has been calculated by use of following formula:

$$\text{Location coefficient} = (E_{ij} / E_i) / (E_j / E)$$

(1)

E_{ij} : Employment in region i of sector j E_i : Sum of employment in region i

E_j : Employment of sector j in Turkey E : Sum of employment in Turkey

Then geographic concentrations were analyzed based on vegetal, animal production and stocks values. Taking into account the geographical concentration coefficient and areas of regions, the concentration structures were analyzed for sectors. Geographical concentration coefficient has been calculated by use of following formula.

$$\text{Geographical concentration coefficient: } (D_{ij} / D_j) / (Y_i / Y)$$

(2)

D_{ij} : Total value in region i of sector j D_j : Total value of sector j in Turkey

Y_i : Area of region i Y : Area of Turkey

Location and geographical concentration coefficients were calculated for 2010 and 2015. Related data were obtained from the Turkish Statistical Institute(TU K)-Agricultural Structure and Workforce Statistics.

RESULTS AND DISCUSSION

Location coefficients have been calculated for four major sectors taking into account the employment of population in Level 2 Regions (Figure 1). Thus regional potentials have been identified based on sectoral concentration. For a sector the region where location coefficient is above 1 is defined as intensively concentrated for such sector.

When agricultural sector is considered, 19 regions with location coefficient above 1 have been identified. The highest location coefficient is in TRA2 region. It is followed respectively by TRA1, TR90, TR82, TR83, TRB1, TR81, TR33, TR22, TR71, TRB2, TR63, TR52, TR61, TR32, TR62, TR72, TRC3 and TRC2. The region where agriculture concentration is the least is TR10 region. Black Sea and Eastern Anatolia Regions are the ones having high concentration of agriculture sector (location coefficient above 2)(Figure 1).

When industrial sector is considered, 7 regions with location coefficient above 1 have been identified. TR41 is the one having the highest location coefficient for industrial sector. It is followed by TR10, TR21, TR42, TRC1, TR31, TR72 regions. The region where industrial concentration is the least is TRA1 region.

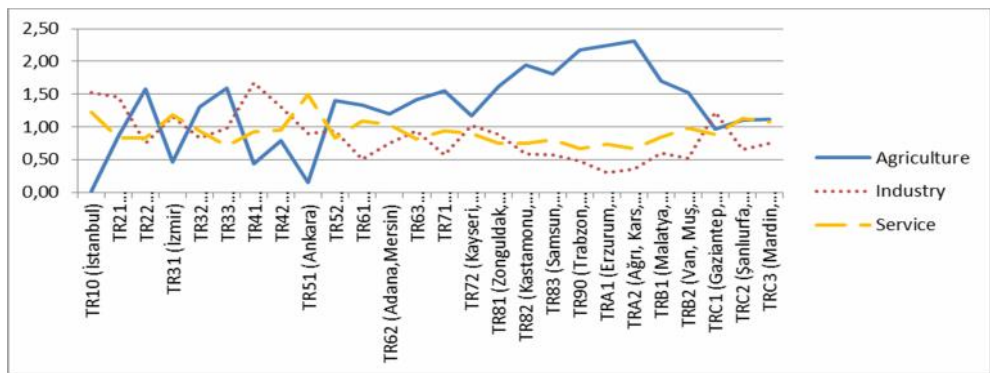


Figure 1. Location coefficients based on employment in rural residential regions (2010)

When service sector is studied, TR51 region is the one having the highest concentration. It is followed by regions TR10, TR31, TRC2, TR61, TRC3, and TR62. TRA2 region is the one having the least concentration for service sector. When concentrations between 2010 and 2015 are considered for agriculture sector, it is noticed that some regions show important differences. When location coefficients difference for 2010 and 2015 are considered, the biggest change is seen in TRB2 region (Figure 2).

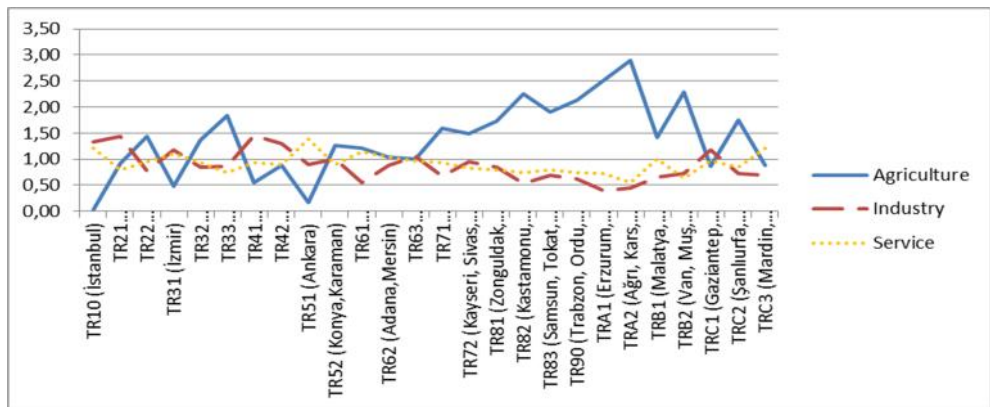


Figure 2. Location coefficients based on employment in rural residential regions (2015)

This part analyzes geographical concentration in respect to three structures. They are vegetal production values, animal productions and livestock values. Taking into account the geographical concentration coefficient method and areas of regions, the concentration structures in the regions were analyzed for sectors. The geographical concentration coefficient of Turkey is 1. Accordingly, it is seen that the production level is low where geographical concentration coefficient is under 0.5, and production level is close to Turkey's average in the regions where geographical

concentration coefficient is between 0.5 and 1.5 and production is gradually concentrated where geographical concentration coefficient is 1.5-3 and 3+(Elvan et al., 2005).

Vegetal production has concentrated in Mediterranean and Aegean coastline regions and TR22 region in 2010 (Table 1). Vegetal production has been at low level in Eastern and South-Eastern Anatolia Regions (TRB1, TRB2, TRA2, TRA1), TR72 in Central Anatolia Region and TR81 and TR82 in West and Central Black Sea region. Vegetal production in other regions has occurred at average of Turkey. In 2015, vegetal production has concentrated in TRC1 and TR90 regions. What is noticed here is that geographical concentration coefficients of regions TR31, TR61, TR62 and TR22 in Aegean Region have decreased when compared to those of 2010. Despite higher geographical concentration coefficients for years, it can be said that these two regions have got away from vegetal production.

Table 1. Vegetal and animal production and livestock concentrations

2010	Vegetal Production	Livestock	Animal Production	2015	Vegetal Production	Livestock	Animal Production
TR10	0.48	1.01	1.04	TR10	0.41	0.71	0.70
TR21	1.38	1.40	1.17	TR21	1.34	1.35	0.69
TR22	1.50	2.05	2.53	TR22	1.12	1.88	0.86
TR31	2.76	2.55	3.50	TR31	2.34	3.18	1.39
TR32	1.59	1.30	1.12	TR32	1.36	1.12	0.70
TR33	1.06	1.20	1.46	TR33	0.96	1.24	0.42
TR41	1.15	0.80	0.87	TR41	1.15	0.83	0.34
TR42	1.17	1.56	3.87	TR42	1.39	1.37	0.51
TR51	0.92	0.57	0.58	TR51	0.79	0.77	0.27
TR52	0.72	0.84	0.70	TR52	1.13	0.98	0.45
TR61	2.48	0.73	0.61	TR61	1.79	0.86	0.42
TR62	2.37	0.87	1.02	TR62	2.14	0.79	0.41
TR63	1.83	0.81	0.67	TR63	1.60	0.84	0.39
TR71	1.27	1.01	0.97	TR71	1.45	1.49	0.66
TR72	0.38	0.75	0.67	TR72	0.44	0.68	0.36
TR81	0.47	1.08	0.79	TR81	0.52	0.72	0.28
TR82	0.38	0.77	0.74	TR82	0.33	0.65	0.39
TR83	1.29	1.09	1.17	TR83	1.35	1.02	0.43
TR90	0.90	0.59	0.83	TR90	1.57	0.52	0.57
TRA1	0.18	0.76	0.68	TRA1	0.17	0.81	0.43
TRA2	0.13	1.81	1.31	TRA2	0.20	1.66	0.76
TRB1	0.33	0.67	0.53	TRB1	0.41	0.72	0.29
TRB2	0.18	1.34	0.78	TRB2	0.20	1.10	0.45
TRC1	1.33	0.78	0.54	TRC1	1.67	1.05	0.42
TRC2	1.32	0.91	0.64	TRC2	1.29	0.97	0.41
TRC3	0.68	0.85	0.59	TRC3	0.69	0.79	0.37

When geographical concentration coefficients are studied in respect to animal production in 2010, it is seen that animal production has concentrated in regions TR31, TR22, TRA2 and TR42 (Table 1). Other Level 2 regions have production

levels close to Turkey average. In 2015 only region TR31 concentrated in animal productions while all other regions were close to Turkey average.

In 2010, regarding livestock, regions TR42, TR31 and TR22 concentrated above Turkey average and comparative superiority of these regions are seen in the sector (Table 1). Other regions have livestock at Turkey average. In 2015, concentration coefficients of regions TR42, TR31 and TR22 went below 1.5.

CONCLUSION

Studies and practices for elimination of regional differences are considerably complex and difficult as each region has different structure and dynamics. For that reason, the primary condition to achieve the target is to identify the structural features of each region and make a planning accordingly.

In this study Level 2 regions have been studied for agricultural sector. In this frame, location coefficients have been found out in order to identify the regions where agriculture has priority. Location coefficients calculated separately for 2010 and 2015 have also allowed commenting on differences in this process. According to the results, Black Sea and Eastern Anatolia Regions are the ones where agriculture concentration has occurred. When concentrations in 2010 and 2015 are considered, the biggest change in terms of agriculture sector has been in region TRB2. Then the geographical concentrations in agriculture were studied in respect to vegetal production, animal production and livestock production. The concentrations were calculated for 2010 and 2015 separately. The results indicate that the most concentration in vegetal production is in Aegean and Mediterranean Sea coasts in 2010. It is likely to say that vegetal production level in Eastern and south-Eastern Anatolia (TR72, TR81 and TR82) is low. When comparison is made in respect to 2010 and 2015, it is seen that vegetal production has decreased in Aydın, Denizli, Mu la (TR32) located in Aegean Region while vegetal production in TR61 and TR42 has increased. Animal production has concentrated in TR42 consisting of Kocaeli, Sakarya, Düzce, Bolu, Yalova and İzmir, Balıkesir, Çanakkale regions in 2010. Regarding livestock, concentration in TR31 (İzmir), TR22 (Balıkesir, Çanakkale) TRA2 (A rı, Kars, I dır, Ardahan) above Turkey average for each period suggests comparative superiority of the regions for the sector. When the study is evaluated in general, agriculture sector in employment terms concentrate in Eastern Anatolia and Black Sea Regions but concentration remains at low level in terms of production. Indicating low concentration in terms of agriculture sector İzmir (TR31), Adana, Mersin (TR62), Antalya, Isparta, Burdur (TR61), Tekirda , Edirne, Kırklareli (TR21), Aydın, Denizli, Mu la (TR32), the concentration in other sectors in terms of employment has an important place. Particularly, it is likely to say that İzmir is the most important city forming inter-sectoral integration. Low agricultural production level of regions having agricultural employment concentration is the most important finding to be considered. Particularly, contrary to Erzurum, Erzincan, Bayburt (TRA1), A rı, Kars, I dır, Ardahan (TRA2) known as important regions for animal growing is considerably under Turkey average contrary to what's expected. Although priority

will be given to regions where resources are utilized more efficiently as per policies in effect and potential incentives, some social factors should not be ignored as seen in Eastern Anatolia region. Concentration of employment in agriculture sector in such regions is a factor decreasing competitiveness strength. In this framework, in addition to works for enhancement of efficiency in the sector, projects providing transfer of work force concentrated in agriculture to different sectors should be achieved. The studies to be made in order to ensure regional development and achievement of development targets should be performed in the light of consideration of some fundamental findings exemplified above. Studies to analyze all sectors and sub-sectors should be conducted for discovery of sectoral integration level and identifying the issues since regional development is targeted today. It is also essential that the studies to be conducted cover the EU harmonization process. The most important duty of the regional development agencies in this respect is to discover internal dynamics of each region and distribution of available financial resources in the most effective way. For instance, study of projects conducted for sectoral integration and development for Izmir displaying an essential level in terms of development, will constitute a good and important example for other regions. At this point, it should not be ignored that each region has different structure.

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