

Structural Problems of Regional Development Practices in terms of Sectoral GDP per capita in Turkey

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In integration of Turkey to the EU, the scope of regional programs has been transformed to reach the basic regional socio-economic standards of the Union. In this way, new cooperative regional programs have been applied in Turkey by the EU and Turkey. Therefore, some regional programs in Nomenclature of Territorial Units for Statistics (NUTS) level-2 regions have been examined in this study. In this point, the data of regional GDP per capita by sectors has been used to analyse sectoral disparities in terms of Gini index. To discuss and evaluate the future of the programs on regional disparities, related sector parameters of GDP per capita have been calculated by regression analysis through (balanced) panel data. The findings showed that there is a remarkable sectoral disparity among program regions, and the sector priorities of the programs are not sufficient to bring any long-term solution for the regional disparities. Finally, Turkey from regional and/or multiregional perspectives needs to reconsider the regional programs for decreasing the disparities as much as development of the regions.

Key words: Regional program, Sectoral GDP per capita, Gini index, the EU, Turkey

I Introduction

Formally, development is constituted and reproduced within a set of material relationships, activities and powers such as social, cultural and geo-political. The power of institutions can not be ignored to comprehend the development in geographical and regional contexts (Crush, 1995). Small countries to integrate their economies in order to strengthen their bargaining position in a world of rapidly growing national and regional markets necessitate international development policies (Dell, 1991) that need to be distinguished for developing countries at more local and sectoral levels. A phenomenon

also exists in many cases in which countries apply policies to integrate their economies to the world or regional unions by using international grant programs. This phenomenon was mentioned by Pomerantz (2004) as foreign aid is unproductive, vain, and fruitless in some cases because instrumental rationality has overtaken purposive action and reform; reform that can place people at the centre of interaction and change. Obviously, grant programs and aid programs have very different features in the scope and the purposes, but, these programs sometimes bring similarities for receiver countries in the outcomes of insufficient implementations.

There have been various regional plans, programs, and projects to eliminate the regional disparities in Turkey since the 1960s; however, any remarkable result has not been observed yet. The regional inequalities in Turkey from different aspects have been studied by many researchers and the findings are not so different. Gezici and Hewings (2002) in their study pointed out overall inequalities decreased; however, spatial dependence became more dominant. The Theil index in their study also indicated that interregional inequalities increased while intra-regional inequalities declined from 1980 to 1997. The most developed provinces enhanced overall inequalities. In another study, Ozturk (2005) examined regional income disparities in terms of Gini index, Theil index and Atkinson inequality index with respect to NUTS regions for 1965-2001 and found out that regional income disparity tended to increase until the end of the 1980s, but tended to decrease in the 1990s. He also mentioned in his study as concluding remarks that in this decrease there could be many reasons such as population movements from underdeveloped regions to developed regions (such movements decrease the GDP per capita of developed regions and increase the underdeveloped regions'), effect of NPA (National Development Plans), and huge investment flows into GAP¹⁾ (South-eastern Anatolia Project). Therefore, the decrease in the 1990s could not indicate a real regional equality compared to some other socioeconomic indicators. In early stages of our study, we also observed that GAP project had not been effective in the region in terms of re-

gional disparities (Dincsoy and Ichiminami, 2006a) and sustainable regional development (Dincsoy and Ichiminami, 2006b).

Celebioglu and Dall'erba (2009) provided an extensive literature review in their study from many leading researchers who study the regional inequalities in Turkey on spatial disparities across the regions of Turkey. From different research aspects but with similar findings, they pointed out the regional disparities into three categories by assessing the extent to which the phenomena are the reason or the consequence for the divide observed within Turkey: i) demographic disparities, including migration and urbanization; ii) economic disparities including several components like income and salary; and iii) the disparities in infrastructures including the provision of public services.

In the analyses of regional disparities or imbalances in Turkey, there has been another relevant research point that appeared from formulating, monitoring and evaluating regional development strategies. Ozaslan et al. (2004) focused on SEDI (Socio-Economic Development Index) to determine the structural characteristics of territories in terms of economic and social sectors and to shed light on their potentials. They observed that the economic growth performance of Turkey in the long term could not bring the positive impact as expected on the elimination of developmental disparities between the regions. Although many policies which are currently being implemented, the major ones such as the development of agriculture and stock-breeding, irrigation, construction of village roads, construction of forest

roads, potable water ponds, providing potable water, increasing agricultural and livestock production, afforestation, made notable contributions to the mobilisation of local potentials in some regions, they proved to be insufficient in reducing regional disparities nationwide.

Despite Turkey has spent great effort to integrate her economy to the EU and international markets, there have been critical studies on development plans in reducing regional disparities. As Mutlu (2002) mentioned the failure of central government development plans, GAP and DAP (East Anatolia Project) would not be effective in the development of these underdeveloped regions because of limitations in their geographic and physical positions. Our study generally agrees that development plans are not effective as expected because of the failure of Turkish central government; however, geographic and physical positions of these regions could be used as a tool by investigating the sectoral interactions of these regions with distant and/or neighbouring regions. It may be the only way as a policy to reduce the regional gap of these underdeveloped regions with the developed regions because of the hard socioeconomic conditions in these regions. Moreover, Bilen (2005) well summarized the necessary regional policies for Turkey by the concluding remarks as follows:

- A broad and contemporary regional policy has to be implemented in Turkey to respond internal and external pressures stemming from respectively substantial interregional disparities and European Regional Policy requirements

- In the pre-planning phase, regional analysis of dynamics has not deemed thoroughly from a broadened aspect encapsulating shared responsibilities among relevant ministries and regional agents as well as civil and private stakeholders

- Relatively sound economic environment gravitates toward a new mode of public sector intervention logic in the sense of regionalization

- Recently designated NUTS level-2 regions have too little capacity to undertake program delivery at least in short and medium term

- Turkey needs tremendous and highly targeted efforts to develop competent central and local components of the implementation.

Loewendahl-Ertugal (2005) also approached to the regional disparities and related plans from a different point with regional governance. Regional governance can be useful for abolishing regional disparities and for resource allocation between regions, there are no clear ideas about what kind of a role regional planning and development should play in national development or even about the usefulness of regional planning. National planning, which in Turkey is sectoral in nature, is seen as more important. Lack of ideas about regional planning has prevented the formation of suitable institutional structures and capacity at the regional level. Under the EU influence, it seems that there is an opportunity for the central administration to learn from the practices of the EU countries, especially through the EU technical assistance. In this point, our study agrees with the ideas, which are not clear on abolish-

ing regional disparities, but, the central administration to learn from the practices of the EU countries, especially through the EU technical assistance is debatable because the EU is an union that has not succeeded a regional convergence among its member countries yet, even has not came close to its regional convergence targets.

From all aspects above, as an attempt to explain the regional development and the disparities more appropriately, this study examines the sectors among specific regions focusing on the regional programs, which are mostly supported by the EU grants in some Turkish NUTS regions. The study will begin by theoretical framework of “regional integration and regional organizations” and “development projects and regional interactions” due to the scope and the aim of the programs. For the statistical analyses, the regional GDP per capita distributions²⁾ by sectors as a first time to the best of an extensive literature review for this study will be used according to the years. This data is collected from several data books and online data of TUIK (Turkish Statistical Institute) and DPT (State Planning Organization) by varying on the sectoral purpose of the study. Then, to indicate some structural problems in regional development practices in Turkey, Gini index by sectors will be used and to reach more realistic solutions than single GDP per capita analyses in the literature on regional inequalities regression analysis will be evaluated by utilizing sectoral parameters from the panel data.

Solely finding the regional problems and/or giving assessments without comprehensive

sectoral analyses can not effectively help us to find out the best solution mechanisms for the regional problems. Finally, donor countries (or organizations) and receiver governments need to be aware of greater levels of regional, sectoral and individual needs of program areas to provide a truly effective support for decreasing regional disparities.

II Theoretical Framework

1. Regional Integration and Regional Organizations

Regional integration schemes have gained more importance in the past few years, and the significance of regional groups have increased dramatically. Regional integration, however, is no new phenomenon. Regional examples of leagues, commonwealths, unions, associations, pacts, confederacies, councils, etc. are spread throughout history. Economists who currently study regional integration primarily focus on market relationships among goods and factors of production within a region and assume away the relevance of institutional and political forces (Mattli, 1999); however, international organizations like the EU can develop regional programs to encourage regional cooperation (Dwan, 1999).

The current regional development organizations have some principal functions, which are also associated with sub-regions of countries. These functions can be summarized as ‘economic and social development’, ‘development policies and plans’, ‘grants or investment for development purposes’, ‘technical assistance

for development projects and programs', and 'regional integration' (Farrell, 2004). Regional development efforts require an optimistic and a logical element of interactions (Tarp and Hjertholm, 2000). Consequently, regional development organizations play a significant role in the phase of social and economic development of regions, and it has also been a comprehensive policy for Turkey to get full attention of other organizations. Producing programs and projects together with managerial and financial supports of the EU need to be multi-dimensional based on the key sectors that show the beginning point of regional integration and development.

2. Development Projects and Regional Interactions

Similarly, regional development projects are a process aimed at the alleviation of poverty, the creation of infrastructure, the establishment of sustainable development, the promotion of economic growth and convergence, and the expansion of integration into international or national political systems of regions (Dincsoy and Ichiminami, 2006b).

The interactions can be principally divided into two parts for donor and receiver countries as short- and long-term solutions. Short-term solution is strongly based on emergency cases like earthquake instead of solution of the problem. Long-term solution is related with social aspects in a different direction that can be summarized as helping the developing or underdeveloped countries to solve their problems on their own. In other words, the most important

difference between short- and long-term solutions is not the time period; it is, thus, to solve the problems on their own by means of development programs and projects. Therefore, the EU as a donor organization of the grant programs in the long-term solution could be an effective factor for Turkey in the point of regional development and regional interactions.

III Overview of Regions and Programs Supported by the EU in Turkey

1. Overview of Program Regions

In addition to the geographic regions, Turkey has been divided 12 NUTS level-1 regions, 26 NUTS level-2 regions and 81 NUTS level-3 regions in the base of adaptation with the EU since September 2002³⁾. In different scopes and sizes, some regional programs have been supported by the EU focusing on the less developed areas in the eastern part of Turkey. NUTS level-2 regions and program areas (approximately covered half of Turkey) are shown in Fig. 1. The 1st PR (Program Region) is a group of TR82, TR83, and TRA1, the 2nd PR is TRA2, TR72, TR52, and TRB1, the 3rd PR is single region TR90, and similarly the 4th PR is TRB2.

In Fig. 2, the schematic expansion of the programs over Turkey was shown in terms of '*Theoretical Framework*' of the study. Namely, the main interactions are usually built on financial bodies of the EU and Turkish central government. Turkish central government manages DPT under the responsibility of Prime Ministry, and DPT coordinates sub-regions. Even though the EU can directly deal with sub-regions or lo-

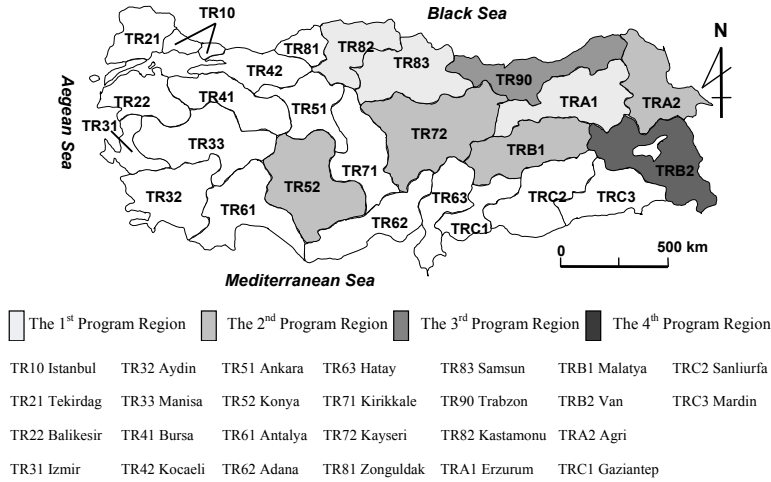


Fig. 1 NUTS level-2 regions in Turkey
Source: DPT (2007)².

cal governments, it is difficult to eliminate the functional position of DPT in the implementation process of regional development projects (Dincsoy and Okur, 2005). Although it seems very natural interactions, there is an overlook by missing the importance of regional project cooperation among the NUTS regions. To show this missing point, NUTS level-1 regions were also categorized as the developed, developing, and underdeveloped regions in Fig. 2 according to their GDP per capita levels⁵. For instance, TR72, TR52, TRB1, and TRA2 (NUTS level-2) regions are the main area of the 2nd PR under their related NUTS level-1 regions (three developing and one underdeveloped) and they have neither social interaction nor economic cooperation with each other within the framework of programs; they are solely receiving financial support for related NUTS level-3 regions. In short, NUTS level-3 regions provide projects for the grants separately in the scope

of NUTS level-2 and this type of interaction eventually increases the dependence of the regions to the other bodies. Since these programs are supported by the EU, some project networks and advisory systems should be also considered among NUTS regions as a priority at international as well as at national levels in order to decrease their dependence, resulting in a better regional integration.

As another critique, although some regional development targets are aimed, there are no specific criteria for grouping these regions such as population interactions, possible interactive investment opportunities, and geographical proximity among regions. For this reason, there will be assessments and evaluations of the study by testing the sectoral features of program regions to find out the answers of two questions: "Are these programs for the development of regions in Turkey by expecting an expansion over all the other regions?" or "Are

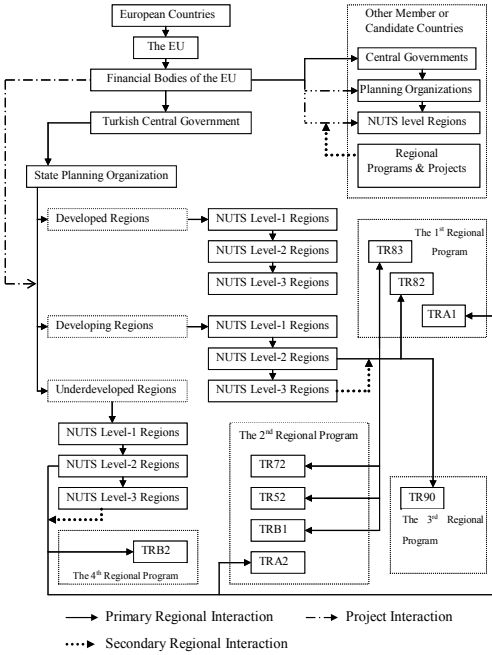


Fig.2 Schematic expansion of regional development projects supported by the EU over Turkey

these programs for the regional development by contributing a solution to the regional disparities in Turkey?"

2. Overview of Programs Supported by the EU in Turkey

The aim of the 1st program is to encourage the plan and projects of Local Development Enterprises (LDEs), SMEs, and Small Scale Infrastructure (SSI) by the grants, and to support them during the implementation process by giving technical support in these regions. The offering invitations within the context of the program were published in May 2005 and the mandatory grants for the potential and prosperous projects were listed. In May 2006,

it was signed with 396 originators of the projects. The activity of project implementations and controlling are still ongoing (DPT, 2007). According to the priority areas in Table 1, SSI takes the highest amount of the support, from the EU (€18.50 million) and Turkey (€6.17 million) respectively.

The general aim of the 2nd program is to increase the capacity in project preparations and implementations of central and regional bodies as well as to contribute to the economic development of NUTS level-2 regions as prescribed in NDP within the context of economic and social cohesion. Under the process of program and negotiations with the EU, an application procedure was completed in July 2006 and it is signed with 509 originators of the projects in September 2006. In addition, under the technical support priority, it was also planned to give a training program to four-thousand farmers based on the EU standards in each region and started in the beginning of 2007 (DPT, 2007). It is the biggest project field among all programs supported by the EU in terms of both total amount of the grants and geographical distribution (Table 1 and Fig. 1).

The aim of the 3rd program is to contribute to a regional development by decreasing the inter-regional differences, and also to increase the capacity in project preparations and implementations of central and regional bodies. To support projects in six NUTS level-3 regions of TR90, the same methodology was used as sending out an invitation to tender in the competitive conditions and the program for projects was also declared in April 2007 with information meet-

Table 1. Priority areas and the scope of grants in the program regions

Priority Areas	The Program Regions	The EU Support (million €)				Turkey Support (million €)				TOTAL
		1 st	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th	
Local Development										
Enterprises		7.40	12.26	4.20	-	2.46	4.08	1.40	-	31.80
SMEs		11.10	18.37	6.90	4.60	3.70	6.13	2.30	-	53.10
Small Scale										
Infrastructure		18.50	30.62	-	-	6.17	10.21	-	-	65.50
Technical Support		3.00	8.00	-	5.00	-	-	-	-	16.00
Support to Managerial Structures										
		-	0.75	-	-	-	0.25	-	-	1.00
Tourism & Environ.										
Infrastructure		-	-	6.90	9.40	-	-	2.30	-	18.60
Small Size Enterprises		-	-	-	10.00	-	-	-	-	10.00
Social Development		-	-	-	3.60	-	-	-	-	3.60
Agricultural & Rural Development										
		-	-	-	12.40	-	-	-	-	12.40
TOTAL		40.00	70.00	18.00	45.00	12.33	20.67	6.00	0.00	212.00

Source: DPT (2007).

ings in these regions (DPT, 2007). SMEs (with €6.9 million) and tourism & environmental infrastructure (with €2.3 million) have the same amount of grant from the EU and Turkey (Table 1). The scope and feature of the program is relatively smaller than the other programs.

The 4th program, which is also called as Eastern Anatolia Development Program (EADP), was prepared to create a capacity in the centre and region in order to implement innovative regional policy and planning approaches for sustainable development of the region under the coordination of DPT. The aim of the program is to support sustainable and socio-economic development and reduce regional disparities throughout capacity building by the implementation of regional development projects in the region. The preparations for possible projects in a competitive procedure were started in 2001

and in the following term it was signed with 309 successful project applicants. The program was finalised in the end of 2007 and project implementations, monitoring and evaluation activities are continuing (DPT, 2007). TRB2 is given different priority areas as the most underdeveloped region in Turkey. The different priorities are small size enterprises, agricultural & rural development, and social development. However, Turkey has not given any grant to this program.

IV Regional Income Disparities by Sectors in the Program Regions

In the classification of regions as developed, developing or underdeveloped, the distributions of their GDP per capita with the growth rates are the most determining factors. They also bring an inefficient description for the field of

projects. To improve the necessary descriptions, the sectoral distributions in GDP per capita in 1987, 1994, 2001, and 2006 (estimated)⁶⁾ are given in Tables 2, 3, 4, and 5 according to the program regions and examined by Gini index together with Lorenz curves⁷⁾. Therefore, we will be able to evaluate the sectors that have kindled the regional income disparities among program regions.

In Tables 2-5, TR52 has the highest GDP per capita in 1987, 1994, and 2001 (1,145,098, 1,374,454, and 1,267,800, respectively); the lowest distributions are in TRA2 in 1987 (323,696) and TRB2 in 1994, and 2001 (369,644 and 389,379, respectively). The difference between the highest and the lowest GDP per capita values is very high throughout the years. According to the sectoral distributions, the agriculture sector in TR52 has the highest share with 402,709 in 1987, 384,604 in 1994, and

289,115 in 2001 among all program regions. TR52 is under sectoral shrinkage. From 1994 to 2001, all program regions, except TRA2, experienced the agricultural shrinkage. In all developed or underdeveloped regions without exception, the sectors of transportation & communication, business & personal services, and government services only had greater value in 2001 than in 1987; other sectors like agriculture showed different tendency as growth or shrinkage tendencies depending on the region and the year.

As seen in Table 6, there have been regional disparity increases according to the Gini coefficient from 1987 to 2001, and continued in 2006. There were only specific decreases in some years in some sectors, which are trade (0.236 in 1987 and 0.222 in 2001), government services (0.085 in 1987 and 0.069 in 2001) and construction (0.233 in 2001 and 0.218 in 2006). Four

Table 2. Regional GDP per capita by sectors in the program regions, 1987
(TL at 1987 constant prices)

Regions	The 1 st PR			The 2 nd PR				The 3 rd PR	The 4 th PR
	TR82	TR83	TRA1	TR52	TR72	TRB1	TRA2	TR90	TRB2
Sectors									
GDP per capita	779,493	897,952	687,743	1,145,098	788,396	738,767	323,696	854,568	364,606
Agriculture	333,742	269,691	186,262	402,709	193,281	166,940	156,140	267,725	120,232
Industry	61,955	141,108	80,320	197,599	112,472	216,580	16,388	145,528	21,304
Construction	60,292	59,245	66,451	89,786	73,644	54,443	15,535	50,317	28,965
Trade	68,829	199,637	125,177	168,104	165,460	103,722	29,781	127,721	35,255
Transportation & Communication	121,089	89,340	80,769	129,369	96,035	61,672	23,151	130,583	48,279
Financial Institutions	14,702	16,576	14,566	17,427	16,147	10,134	4,853	20,781	6,518
Ownership of Dwelling	41,229	49,790	30,317	59,611	46,428	43,745	26,873	42,998	39,281
Business & Personal Services	8,506	14,280	7,752	13,250	11,819	7,444	1,377	10,748	3,085
Government Services	69,446	56,469	96,558	61,410	68,950	73,589	48,214	59,853	60,514
(Less) Imputed Bank Service Charges	10,360	10,883	9,357	12,478	13,951	7,740	3,181	18,579	3,340
Private Non-Profit Institutions	1,546	1,209	2,336	1,588	2,218	1,724	1,235	1,910	1,529
Import Duties	8,517	11,491	6,592	16,723	15,894	6,513	3,330	14,983	2,984

Source: TUIK (1997), TUIK (2008), DPT (1999), and DPT (2003).

Table 3. Regional GDP per capita by sectors in the program regions, 1994
(TL at 1987 constant prices)

Regions	The 1 st PR			The 2 nd PR				The 3 rd PR	The 4 th PR
	TR82	TR83	TRA1	TR52	TR72	TRB1	TRA2	TR90	TRB2
Sectors									
GDP per capita	873,751	1,005,369	643,680	1,374,454	863,875	850,481	427,126	1,092,848	369,644
Agriculture	273,688	262,075	142,685	384,604	159,035	155,965	164,223	331,426	93,109
Industry	69,640	200,686	69,480	254,645	166,643	227,084	22,547	149,931	19,854
Construction	73,901	59,359	53,791	110,115	60,494	55,431	11,775	78,424	19,985
Trade	112,024	209,005	106,609	207,676	175,443	118,975	47,607	175,846	31,543
Transportation & Communication	164,480	106,880	89,965	206,450	118,066	77,090	36,558	186,849	47,450
Financial Institutions	11,699	12,536	10,422	18,164	14,330	10,901	6,544	47,422	4,650
Ownership of Dwelling	21,403	30,112	12,137	38,573	21,038	20,110	13,006	26,302	11,263
Business & Personal Services	15,251	23,137	10,001	25,390	20,288	13,037	3,268	22,933	3,981
Government Services	136,392	110,678	152,360	125,869	126,119	176,766	126,531	130,839	139,745
(Less) Imputed Bank Service Charges	14,289	23,717	8,878	33,023	15,905	14,596	9,550	73,150	4,892
Private Non-Profit Institutions	165	230	243	484	240	152	122	272	89
Import Duties	9,397	14,389	4,866	22,100	18,084	9,566	4,495	15,756	2,865

Source: TUIK (1997), TUIK (2008), DPT (1999), and DPT (2003).

Table 4. Regional GDP per capita by sectors in the program regions, 2001
(TL at 1987 constant prices)

Regions	The 1 st PR			The 2 nd PR				The 3 rd PR	The 4 th PR
	TR82	TR83	TRA1	TR52	TR72	TRB1	TRA2	TR90	TRB2
Sectors									
GDP per capita	1,019,963	1,120,749	646,090	1,267,800	952,108	804,549	480,912	1,053,000	389,379
Agriculture	245,692	223,829	151,587	289,115	141,053	136,906	168,842	253,195	119,828
Industry	87,064	217,221	44,657	222,777	177,647	185,804	16,473	142,606	21,598
Construction	55,866	49,479	34,950	63,242	66,417	41,148	32,932	54,664	21,572
Trade	122,642	215,760	98,905	186,376	171,554	105,516	45,816	159,676	27,326
Transportation & Communication	261,654	170,811	98,359	248,794	152,471	96,819	68,731	220,187	59,114
Financial Institutions	11,801	15,284	9,455	15,721	11,194	10,960	8,816	40,298	4,627
Ownership of Dwelling	25,380	40,479	25,256	61,311	31,224	28,478	12,845	28,479	8,414
Business & Personal Services	15,341	24,828	8,103	20,826	20,809	11,289	2,777	20,924	3,247
Government Services	194,539	163,226	180,576	144,843	164,880	184,361	126,986	146,548	122,511
(Less) Imputed Bank Service Charges	14,561	18,527	11,409	12,958	9,640	6,421	6,078	26,836	2,606
Private Non-Profit Institutions	465	672	512	973	458	240	312	529	174
Import Duties	14,078	17,687	5,138	26,779	24,042	9,449	2,461	12,731	3,574

Source: TUIK (1997), TUIK (2008), DPT (1999), and DPT (2003).

sectors, which are financial institutions, industry, transportation & communication, and business & personal services, severely aggravated regional disparities in the program regions.

Lorenz curves for GDP per capita by sectors are given in Figs. 3 and 4 and did not indicate

any remarkable decrease in regional disparity as well. As an optimistic point, regional disparities have a slower increasing tendency in the sectors after 1994. As it is estimated for 2006, industry, transportation & communication, and financial institutions sectors in Fig. 3 and own-

Table 5. Estimated regional GDP per capita by sectors in the program regions, 2006
(TL at 1987 constant prices)

Regions	The 1 st PR			The 2 nd PR				The 3 rd PR	The 4 th P
	TR82	TR83	TRA1	TR52	TR72	TRB1	TRA2	TR90	TRB2
Sectors									
GDP per capita	1,366,727	1,549,432	687,809	1,868,822	1,202,921	976,288	612,413	1,405,815	413,802
Agriculture	361,669	407,106	175,587	554,961	235,452	198,620	229,311	407,986	114,711
Industry	100,494	273,327	72,258	294,969	191,366	180,313	14,988	131,363	20,630
Construction	78,738	65,585	47,042	118,460	70,578	47,898	44,586	84,948	26,266
Trade	162,947	259,891	107,902	251,466	207,322	126,765	56,524	214,400	27,909
Transportation & Communication	309,176	205,148	86,251	313,841	172,292	91,508	68,650	260,040	47,566
Financial Institutions	20,409	34,791	14,898	37,871	20,292	23,077	15,394	111,671	6,615
Ownership of Dwelling	19,787	32,520	19,767	49,987	19,472	12,852	8,329	23,383	10,600
Business & Personal Services	21,706	37,575	8,659	33,978	26,962	15,419	4,133	30,992	3,717
Government Services	287,476	234,792	158,452	203,739	235,716	278,332	176,735	205,524	155,137
(Less) Imputed Bank Service Charges	16,704	23,861	9,615	25,910	10,461	11,378	8,313	80,714	3,312
Private Non-Profit Institutions	-	-	-	-	-	-	-	-	-
Import Duties	21,554	22,815	5,666	35,579	34,770	13,868	2,618	17,052	3,564

Note: Private non-profit institution(s) are not estimated due to its size and share in GDP per capita.

Source: Estimations from TUIK (1997), TUIK (2008), DPT (1999), and DPT (2003).

ership of dwelling, business & personal services sectors, import duties, and GDP per capita in Fig. 4 show ocular divergence from the curves of 1994 and 2001.

The findings above are providing an idea in assessing the sectoral situation of the regional disparities; however, they are not capable to explain the relations between sectoral situations and the regional disparities.

V Analyzing Sectoral Effects on Regional GDP per capita Growth

In this section, two research points are basically aimed. The first is to show the effect of the sectors over regional GDP per capita in the program regions. And the second is to correlate the sectors in a specific program region with other program regions' GDP per capita.

Hence, GDP per capita components as an

Table 6. Gini coefficients for GDP per capita by sectors

Sectors	1987	1994	2001	2006
Agriculture	0.186	0.228	0.233	0.246
Industry	0.277	0.287	0.292	0.329
Construction	0.182	0.225	0.233	0.218
Trade	0.236	0.217	0.222	0.247
Transportation & Communication	0.198	0.252	0.257	0.289
Financial Institutions	0.176	0.365	0.369	0.425
Ownership of Dwelling	0.103	0.201	0.206	0.281
Business & Personal Services	0.221	0.232	0.238	0.288
Government Services	0.085	0.069	0.069	0.101
Private Non-Profit Institutions	0.123	0.235	0.242	-
Import Duties	0.247	0.266	0.272	0.334
GDP per capita	0.150	0.178	0.184	0.214

Note: (Less) imputed bank service charge(s) are not included

because it always takes a negative value in GDP per capita.

Source: Calculation from Tables 2, 3, 4, and 5.

equation will be based on the sector shares as follows;

$$Y = X_A + X_I + X_C + X_T + X_{TC} + X_F + X_{OD} + X_B + X_G + X_O \quad (1)$$

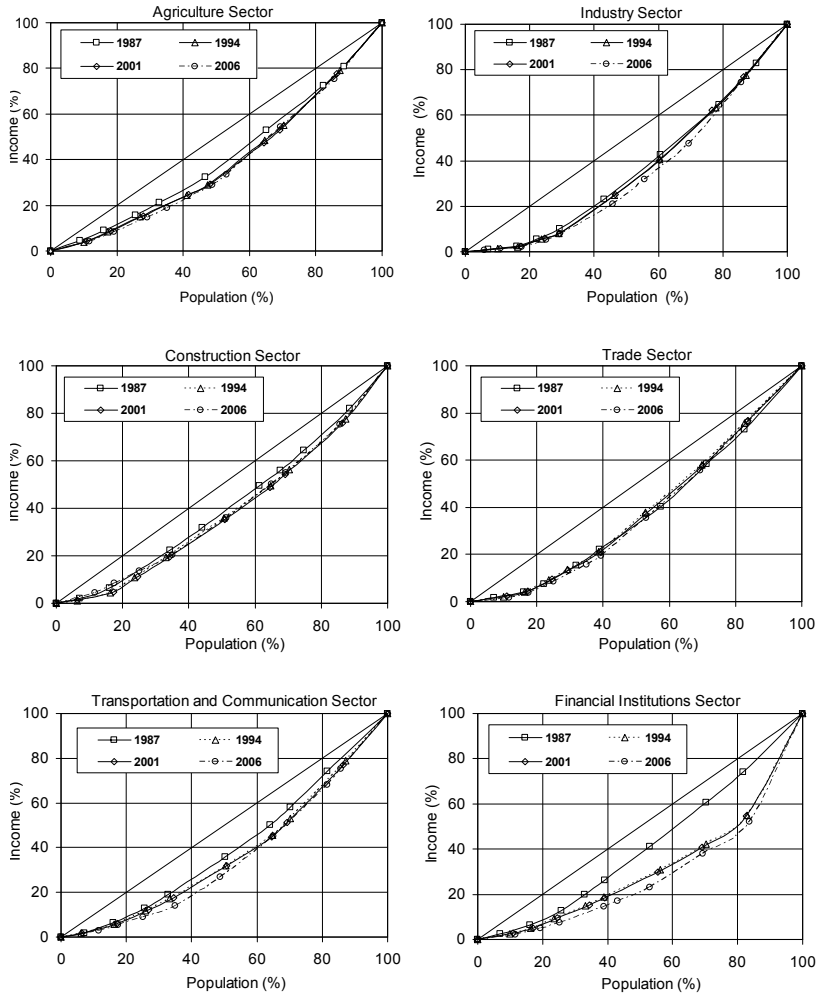
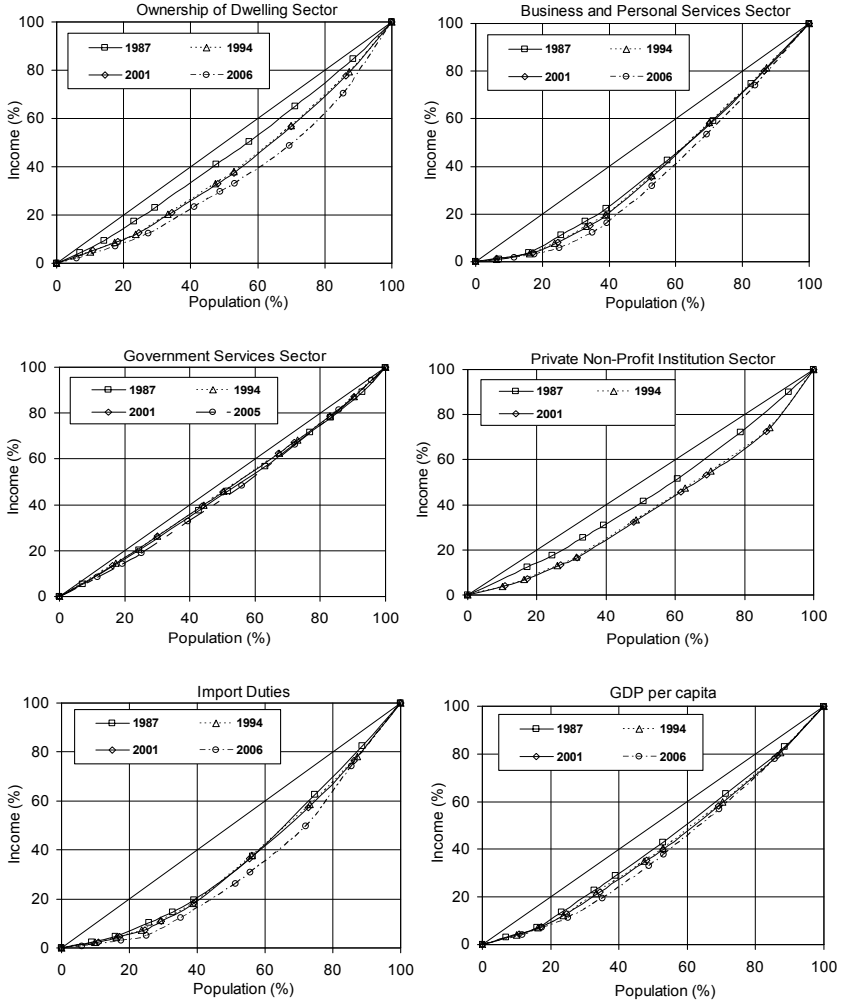


Fig.3 Lorenz curve for agriculture, industry, construction, trade, transportation & communication, and financial institutions
Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007).

Then, Y indicates regional GDP per capita and the distributions of regional GDP per capita by sectors⁸⁾ are Agriculture (X_A), Industry (X_I), Construction (X_C), Trade (X_T), Transportation and Communication (X_{TC}), Financial Institutions (X_F), Ownership of Dwelling (X_{OD}), Business and Personal Services (X_B), Government Services (X_G), and Others⁹⁾ (X_O).

To analyze the effect of sectoral changes (any increase or decrease) on GDP per capita growth, sectoral multiple-correlation was applied according to the priorities of the grant programs¹⁰⁾. In each correlation, the sectors were regressed on each GDP per capita values¹¹⁾ of the program regions to test the possible output of any input to the region. In other



Note: Less imputed bank service charges for all years and private non-profit institutions after 2001 are not illustrated because of their negative (-) values.

Fig.4 Lorenz curve for ownership of dwelling, business & personal services, government services, private non-profit institutions, import duties, and GDP per capita

Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007).

words, sectors in a linear function will determine the sectoral multicollinearity of regions on GDP per capita growth. In this point, R^2 is a statistical measure of explanatory ratio ($R^2 \times 100$) of GDP per capita associated with the

changes of related sectors as well as of how well the regression line explains the real data points (Okur Dincsoy, 2009).

In the case of classical linear regression model, $k-1$ variables and n observations with error

term can be showed as follows (Ertek, 2000);

$$Y_i = \beta_1 + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_k X_{ik} + \varepsilon_i$$

$$(i = 1, 2, 3, \dots, n) \quad (2)$$

If the data is replaced, the values in the equation are $i = 1987, 1988, 1989, \dots, 2001$, Y_i = GDP per capita value of a program region (dependent values), $\beta_{2\dots,k}$ = parameter of related sectors (except for β_1), $X_{2\dots,k}$ = value of related sectors (independent values), and ε_i is the error term. Finally, sectoral samples of the regression equation in a specific program region over each program region's GDP per capita will be as follows (Table 7);

Then, let's see the equation 3 in Table 7 in detail. X_C (construction sector), X_B (business and personal services sector), X_G (government sector), and X_O (other sectors) show the GDP per capita by sectors related with the sectoral priorities given by the EU and Turkey in TR82, TR83, and TRA1 regions as the 1st PR. To examine the sectoral structures of the regions before 2005, these sectors in the 1st PR are regressed on its GDP per capita ($Y_{i,1}$). Also, to correlate the sectoral interactions among the regions, the same sectors in the 1st PR are regressed over the other program regions' ($Y_{i,2}$, $Y_{i,3}$, and $Y_{i,4}$).

Instead of accepting or rejecting the null hypothesis for parameters, the findings with significance levels will infer the sectoral interactions among regions because all sectors are the primary elements of GDP per capita (equation 1) and affect (negative or positive) GDP per capita growth. Then, they need to be allotted as relatively risky or safe project fields¹²⁾ for the region(s) due to the findings by utilizing from

t-statistics¹³⁾.

To evaluate the findings, first let's see the explanatory ratios of GDP per capita associated with granted sectors (Table 8) .

1. Each program region with its granted sectors is significant and they will statistically represent the changes (any negative or positive) in the program regions' GDP per capita (79%, 81%, 81%, and 96% in bold font).
2. The ratio among relatively developed program regions (the 1st PR, the 2nd PR, and the 3rd PR) is high, especially granted sectors in the 1st PR and the 2nd PR over the 3rd PR (90% and 82%, respectively).
3. The ratio between relatively developed program regions and underdeveloped one (the 4th PR) is low, especially in the 3rd PR over the 4th PR (26%).

To decide the grant programs as risky or safe, second let's see Table 9 that extensively shows the data outputs for the sectors by Least Squares Method. In short, columns are the program regions with their granted sectors and rows are the sector outputs of the regression analyses over the each program regions' GDP per capita.

1. The granted sectors in the 1st PR over the each program region:

Over the 1st PR, X_C , X_B , and X_O have a weak sectoral relationship on GDP per capita because of their t-statistics (0.1, 0.4, and -0.3, respectively). These sectors are relatively risky project fields for the 1st PR, especially X_B with 4.5 ± 22.5 ($\beta_B \pm CI$). X_C is relatively safe project field resulting in 1.9 ± 1.4 ($\beta_G \pm CI$) with 3.0 (*t-stat*). Over the 3rd PR, X_B is observed

Table 7. Sectoral Samples of the Regression Equation

Sectors in the 1 st PR over the 1 st , the 2 nd , the 3 rd , and the 4 th PR (3)	Sectors in the 2 nd PR over the 2 nd , the 1 st , the 3 rd , and the 4 th PR (4)
$Y_{i,1} = \beta_{mt} + \beta_C X_{iC,1} + \beta_B X_{iB,1} + \beta_G X_{iG,1} + \beta_O X_{iO,1} + \epsilon_{i,1}$	$Y_{i,2} = \beta_{mt} + \beta_C X_{iC,2} + \beta_B X_{iB,2} + \beta_G X_{iG,2} + \beta_O X_{iO,2} + \epsilon_{i,2}$
$Y_{i,2} = \beta_{mt} + \beta_C X_{iC,1} + \beta_B X_{iB,1} + \beta_G X_{iG,1} + \beta_O X_{iO,1} + \epsilon_{i,1}$	$Y_{i,1} = \beta_{mt} + \beta_C X_{iC,2} + \beta_B X_{iB,2} + \beta_G X_{iG,2} + \beta_O X_{iO,2} + \epsilon_{i,2}$
$Y_{i,3} = \beta_{mt} + \beta_C X_{iC,1} + \beta_B X_{iB,1} + \beta_G X_{iG,1} + \beta_O X_{iO,1} + \epsilon_{i,1}$	$Y_{i,3} = \beta_{mt} + \beta_C X_{iC,2} + \beta_B X_{iB,2} + \beta_G X_{iG,2} + \beta_O X_{iO,2} + \epsilon_{i,2}$
$Y_{i,4} = \beta_{mt} + \beta_C X_{iC,1} + \beta_B X_{iB,1} + \beta_G X_{iG,1} + \beta_O X_{iO,1} + \epsilon_{i,1}$	$Y_{i,4} = \beta_{mt} + \beta_C X_{iC,2} + \beta_B X_{iB,2} + \beta_G X_{iG,2} + \beta_O X_{iO,2} + \epsilon_{i,2}$
Sectors in the 3 rd PR over the 3 rd , the 1 st , the 2 nd , and the 4 th PR (5)	Sectors in the 4 th PR over the 4 th , the 1 st , the 2 nd , and the 3 rd PR (6)
$Y_{i,3} = \beta_{mt} + \beta_C X_{iC,3} + \beta_B X_{iB,3} + \beta_O X_{iO,3} + \epsilon_{i,3}$	$Y_{i,4} = \beta_{mt} + \beta_A X_{iA,4} + \beta_C X_{iC,4} + \beta_B X_{iB,4} + \beta_G X_{iG,4} + \beta_O X_{iO,4} + \epsilon_{i,4}$
$Y_{i,1} = \beta_{mt} + \beta_C X_{iC,3} + \beta_B X_{iB,3} + \beta_O X_{iO,3} + \epsilon_{i,3}$	$Y_{i,1} = \beta_{mt} + \beta_A X_{iA,4} + \beta_C X_{iC,4} + \beta_B X_{iB,4} + \beta_G X_{iG,4} + \beta_O X_{iO,4} + \epsilon_{i,4}$
$Y_{i,2} = \beta_{mt} + \beta_C X_{iC,3} + \beta_B X_{iB,3} + \beta_O X_{iO,3} + \epsilon_{i,3}$	$Y_{i,2} = \beta_{mt} + \beta_A X_{iA,4} + \beta_C X_{iC,4} + \beta_B X_{iB,4} + \beta_G X_{iG,4} + \beta_O X_{iO,4} + \epsilon_{i,4}$
$Y_{i,4} = \beta_{mt} + \beta_C X_{iC,3} + \beta_B X_{iB,3} + \beta_O X_{iO,3} + \epsilon_{i,3}$	$Y_{i,3} = \beta_{mt} + \beta_A X_{iA,4} + \beta_C X_{iC,4} + \beta_B X_{iB,4} + \beta_G X_{iG,4} + \beta_O X_{iO,4} + \epsilon_{i,4}$

Note: β_{mt} indicates the value of ‘Intercept’ showed as β_1 in the equation (2).

Table 8. The explanatory ratio of GDP per capita by correlated sectors ($R^2 \times 100$)

	In the 1 st PR	In the 2 nd PR	In the 3 rd PR	In the 4 th PR
Over the 1 st PR	79	80	62	87
Over the 2 nd PR	82	81	65	86
Over the 3 rd PR	90	82	81	74
Over the 4 th PR	51	54	26	96

Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007) via equations 3 - 6.

as providing a better GDP per capita growth prospect for the 3rd PR with 35.8 ± 20.0 ($\beta_B \pm CI$) and 4.0 (*t-stat*). X_O is also significant and has negative effect as -12.44 ± 8.77 . Over the 2nd PR and the 4th PR, the granted projects hardly result in better GDP per capita growth. As the 4th PR is the most important region as the most underdeveloped, projects in the 1st PR take more importance for the 4th PR than the 2nd PR and the 3rd PR.

2. *The granted sectors in the 2nd PR over the each program region:*

Over the 1st PR, the 2nd PR, and the 4th PR, the sectors (X_C , X_B , X_G , and X_O) appeared in low significance. Over the 3rd PR, the coefficient of

X_B (46.91 ± 36.42) is very significant with 2.9 (*t-stat*) and higher than in the main program region’s coefficient (24.7 ± 28.3). At these significance levels, these sectors are risky projects for the GDP per capita growth of the 1st PR, the 2nd PR, and the 4th PR, which also resulted in low explanatory ratio (54%) in Table 8. In a word, project implementations from the 2nd PR can not be expected to bring a positive outgrowth to the 4th PR.

3. *The granted sectors in the 3rd PR over the each program region:*

Over the 3rd PR, X_B remarkably appeared as a safe field in assisting the GDP per capita outgrowth of the 1st PR, the 2nd PR, and the 3rd PR with the coefficient of 20.1 ± 14.7 , 16.5 ± 13.8 , and 25.9 ± 13.4 , respectively. However, projects for these sectors in the 3rd PR will not potentially bring any outgrowth to the 4th PR, which also resulted in the most insignificant explanatory ratio (26%) in Table 8.

4. *The granted sectors in the 4th PR over the each program region:*

Over the 4th PR, the explanatory ratio of GDP

per capita by the sectors is statistically significant with 96%, which is also the highest among all program regions. Statistically significant and safe sectors are X_A , X_C , and X_C with the coefficients of 1.2 ± 0.4 , 2.1 ± 0.7 , and 0.7 ± 0.1 . They are very partial to provide GDP per capita growth to the region. X_B is very significant over the 1st PR and the 2nd PR, and the coefficients have negative values as -81.5 ± 52.2 and -91.3 ± 51.8 , respectively. In this point, any negative growth in this sector in the 4th PR will decrease its GDP per capita level because of its positive coefficient; however, it will increase the GDP per capita levels of other program regions because of their negative coefficients. For this reason, X_B is the riskiest sector that deepens its GDP per capita gap with the other regions by any negative growth. As an example, X_B in the 4th PR had a negative growth as 3,981 in 1994 and 3,247 in 2001 (Tables 3 and 4).

Finally, these program regions have some difficulties to reach an optimistic appraisalment for both the development of a specific region and the solution of regional disparities. For instance, if we replace the input of a program grant in the related regression sample (Table 9), we can predict an output in GDP per capita growth for the program regions. Let's assume that the grant in the 1st PR will provide 1 TL increase for the related sectors as $X_C = 1$, $X_B = 1$, $X_C = 1$, and $X_O = 1$, and the output will be between -36 TL and 40 TL over the 1st PR. Over the other program regions, it will be between -26 TL and 44 TL over the 2nd PR, between -9 TL and 60 TL over the 3rd PR, and between -9 TL and 14 TL over the 4th PR. In the same

way, it can be applied for the related sectors in the 4th PR and the results will be as between -3 TL and 19 TL over the 4th PR, between -146 TL and 37 TL over the 1st PR, between -178 TL and 2 TL over the 2nd PR, and between -247 TL and 85 TL over the 3rd PR. These kinds of regional relationships (a very high CI with a low significance) eventually increase the disparities. To provide a truly effective internal and external GDP per capita growth to the 4th PR by reducing regional GDP per capita disparities in the future, different project compositions are deeply needed by safer planning projects with strong relations between GDP per capita growth and sectoral grants.

VI Evaluations and Assessments

These regions and programs are taken into the consideration in this study because regions in the countries can not be exceptionally independent and similarly sectors in the regions can not be realistically without interactions. Even though some sectors such as X_B , X_C , and X_C are observed in the program regions with high coefficients and strong sectoral relationships, the questions still remain unanswered. Therefore, this study seeks a better correlation of the sectors which assist in the regional integration and development projects. An alternative sector composition is applied to decrease the risk of unsystematic project implementations, especially between relatively developed program regions and underdeveloped one.

In Table 10, the explanatory ratios of GDP per capita associated with the sectors are illustrated. The findings are as follows:

Table 9. The Statistical Findings of the Regression Equations

		In the 1 st PR					In the 2 nd PR					In the 3 rd PR				In the 4 th PR					
		Int.	C	B	G	O	Int.	C	B	G	O	Int.	C	B	O	Int.	A	C	B	G	O
Over the 1 st PR	β_k	546,550	0.2	4.5	1.9	-1.4	377,739	3.5	9.3	1.1	11.1	480,635	1.2	20.1	2.2	1,052,866	-0.4	-4.6	-81.5	2.2	30.7
	SE	171,281	2.2	10.1	0.6	4.4	166,715	2.2	13.6	1.0	4.1	163,282	3.6	6.7	0.9	248,018	1.5	2.8	23.1	0.5	12.2
	<i>t</i> Stat	3.2	0.1	0.4	3.0	-0.3	2.3	1.5	0.7	1.1	2.7	2.9	0.3	3.0	2.5	4.3	-0.2	-1.7	-3.5	4.9	2.5
	P-V	0.0	0.9	0.7	0.0	0.8	0.0	0.4	0.2	0.0	0.2	0.0	0.8	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0.0
	CI (\pm)	381,638	5.0	22.5	1.4	9.9	342,221	4.5	20.2	1.3	8.9	359,380	7.9	14.7	1.9	561,056	3.4	6.3	52.2	1.0	27.6
Over the 2 nd PR	β_k	387,366	1.8	12.3	1.3	-6.2	206,926	4.4	24.7	0.3	5.5	372,752	3.1	16.5	1.3	1,191,009	-1.3	-4.9	-91.3	2.2	7.2
	SE	153,591	2.0	9.1	0.6	4.0	156,126	2.1	12.7	0.9	3.9	152,957	3.3	6.3	0.8	245,978	1.5	2.8	22.9	0.5	12.1
	<i>t</i> Stat	2.5	0.9	1.4	2.3	-1.6	1.3	2.1	2.0	0.3	1.4	2.4	0.9	2.6	1.6	4.8	-0.9	-1.8	-4.0	4.8	0.6
	P-V	0.0	0.4	0.2	0.0	0.2	0.2	0.1	0.1	0.8	0.2	0.0	0.4	0.0	0.1	0.0	0.4	0.1	0.0	0.0	0.6
	CI (\pm)	342,221	4.5	20.2	1.3	8.9	347,870	4.7	28.3	2.1	8.6	336,656	7.4	13.8	1.8	556,441	3.4	6.3	51.8	1.0	27.4
Over the 3 rd PR	β_k	338,565	1.3	35.8	0.5	-12.4	246,318	2.9	46.9	-0.2	2.6	404,528	2.3	25.9	1.1	1,608,197	-3.3	-9.2	-77.7	2.5	6.6
	SE	152,176	2.0	9.0	0.6	3.9	201,150	2.7	16.4	1.2	5.0	148,324	3.2	6.1	0.8	453,902	2.8	5.1	42.3	0.8	22.4
	<i>t</i> Stat	2.2	0.7	4.0	0.8	-3.2	1.2	1.1	2.9	-0.2	0.5	2.7	0.7	4.3	1.4	3.5	-1.2	-1.8	-1.8	3.0	0.3
	P-V	0.1	0.5	0.0	0.4	0.0	0.3	0.3	0.0	0.9	0.6	0.0	0.5	0.0	0.2	0.0	0.3	0.1	0.1	0.0	0.8
	CI (\pm)	339,070	4.4	20.0	1.3	8.8	448,189	6.0	36.4	2.7	11.1	326,459	7.1	13.4	1.8	1,026,797	6.2	11.5	95.6	1.9	50.6
Over the 4 th PR	β_k	280,598	1.2	-0.5	0.3	1.3	334,697	0.8	-5.1	0.6	-0.1	307,062	1.3	0.4	0.4	98,978	1.2	2.1	4.0	0.7	0.1
	SE	51,004	0.7	3.0	0.2	1.3	49,979	0.7	4.1	0.3	1.2	44,793	1.0	1.8	0.2	28,234	0.2	0.3	2.6	0.1	1.4
	<i>t</i> Stat	5.5	1.8	-0.2	1.6	1.0	6.7	1.2	-1.3	1.9	0.0	6.9	1.3	0.2	1.8	3.5	7.2	6.7	1.5	12.5	0.1
	P-V	0.0	0.1	0.9	0.1	0.3	0.0	0.3	0.2	0.1	1.0	0.0	0.2	0.8	0.1	0.0	0.0	0.0	0.2	0.0	1.0
	CI (\pm)	113,643	1.5	6.7	0.4	2.9	111,359	1.5	9.1	0.7	2.8	98,588	2.2	4.0	0.5	63,869	0.4	0.7	5.9	0.1	3.1

Note: The abbreviations of β_k , SE, *t* Stat, P-V, and CI in the table indicate the parameter of the related sectors, standard error of the coefficients, *t* test statistic for the coefficients, the probability of obtaining *t* test results, and the interval estimation of population parameters, respectively.

Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007) via equations 3, 4, 5, and 6.

1. Each program region with alternative sector composition is more significant (90%, 88%, 99%, and 97% in bold font) than the granted sector in the program regions.
2. The alternative sectors in the 1st PR and the 3rd PR have higher explanatory ratios (72% and 81%, respectively) over the 4th PR by indicating stronger sector relationships over the 4th PR.
3. The alternative sectors in the 4th PR have lower explanatory ratios (62%, 69%, and 67%) with the 1st PR, the 2nd PR, and the 3rd PR than the granted sectors. In another word, sectors in the 4th PR will not provide better GDP per capita growth over relatively

developed program regions than its own region.

Additionally, Table 11 extensively shows the data outputs for the alternative sector compositions in the program regions over each program region. Findings are as follows:

1. The alternative sectors in the 1st PR over the each program region:

Alternative sectors are X_G , X_T , and X_I , which are significant over its own region. Any increase in X_G and X_I will provide a GDP per capita growth to the 1st PR and the 4th PR. X_T will decrease the GDP per capita of the 4th PR because the coefficient of β_T is negative over the 4th PR. Although this correlation seems an

Table 10. The evaluated explanatory ratio of GDP per capita by correlated sectors ($R^2 \times 100$)

	In the 1 st PR	In the 2 nd PR	In the 3 rd PR	In the 4 th PR
Over the 1 st PR	90	66	93	62
Over the 2 nd PR	91	88	92	69
Over the 3 rd PR	80	88	99	67
Over the 4 th PR	72	51	81	97

Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007).

adverse effect at first sight, it can be used as a tool for decreasing the regional GDP per capita disparities between the 1st PR and the 4th PR. For instance, while X_C and X_I are taking positive coefficients over the 1st PR (1.37 and 2.01, respectively) and the 4th PR (0.32 and 0.79, respectively), negative X_T growth will affect GDP per capita of the 4th PR positively, otherwise a major growth in this sector will deepen the disparity between these two program regions. In this regard, major importance should be given to X_C and X_I rather than X_T .

2. The alternative sectors in the 2nd PR over the each program region:

Alternative sectors are X_T , X_{OD} , and X_B , which are significant over its own region. For GDP per capita growth of the 2nd PR, X_B is the best project field with its coefficient (33.93) which also resulted in 10.67 over the 4th PR. X_T has negative effect over the 4th PR with negative coefficient (-1.27) which can be similarly used as a tool for decreasing the regional disparity by relatively low sector inputs in the 2nd PR.

3. The alternative sectors in the 3rd PR over the each program region:

Alternative sectors are X_T , X_A , X_F , X_C , and X_{TC} , which are significant over its own region. Even though X_T has negative coefficient for both re-

gions, it is necessary for the significance level. For this reason, it can not be ignored that relatively high amount of X_T inputs to this regions can drastically reduce the total GDP per capita by minifying the outputs of X_{TC} , X_C , and X_F . Moreover, X_A is the sector that can be also used as a tool in decreasing the disparities between these regions.

4. The alternative sectors in the 4th PR over the each program region:

Alternative sectors are X^A , X_G , X_C , and X_I , which are significant over its own region. X_A (1.05) and X_G (0.68) with their positive coefficients can provide a GDP per capita growth over its own region. The coefficients of these sectors over the developed program regions of the 1st and the 2nd are also significant and higher than over its own; however, sectors in the 4th PR have low level of explanatory ratios in Table 10 over the 1st PR (62%) and the 2nd PR (69%).

As X_C (1.81) and X_I (1.98) have positive, significant, and greater coefficients than X_A and X_G , they can be used as a solution field of regional disparities with higher sectoral increases in GDP per capita because they have also negative, relatively insignificant, and smaller coefficients over the developed program regions.

As the most underdeveloped region of Turkey, the 4th PR needs to take a higher sectoral growth rates in GDP per capita with proper projects for its development as well as decrease regional disparities. For instance, let's similarly assume that the grant in the 2nd PR will provide 1 TL increase with the alternative sectors as $X_C = 1$, $X_T = 1$, and $X_I = 1$, and the output will be between 10 TL and 96 TL over the 1st

PR, between 20 TL and 70 TL over the 2nd PR, between 17 TL and 83 TL over the 3rd PR, and between 1 TL and 21 TL over the 4th PR. In the same way, if it is applied in the regression for alternative sectors (X_A , X_G , X_C , and X_I) in the 4th PR, the results will be as between -55 TL and 31 TL over the 1st PR, between -54 TL and 21 TL over the 2nd PR, between -73 TL and 29 TL over the 3rd PR, and between 3 TL and 8 TL over the 4th PR. As seen, there will be a positive contribution for the 4th PR at worst.

Finally, to reach a potentially better development practices in the regions and solution mechanism for regional disparities, the sector correlations as given in Table 11 can be expected to give the answers to both questions as helping the development of regions by pro-

viding an expansion over all the other regions and taking a place in the regional development components by contributing a solution to the regional disparities.

VII Conclusions

Some regional programs at national level are used in terms of the EU grants in order to show some concrete evidences of conflicting with regional development targets in Turkey. Naturally, there are advantages and benefits in full membership of Turkey for the EU as well as for Turkey, and implementing various programs and projects are taking very important place as eliminating the regional socio-economic disparities is one of the obligations for Turkey to join

Table 11. The Evaluated Statistical Findings of the Regression Equations

	In the 1 st PR				In the 2 nd PR				In the 3 rd PR					In the 4 th PR						
	Int.	G	T	I	Int.	T	OD	B	Int.	T	A	F	C	TC	Int.	A	G	C	I	
Over the 1 st PR	β_k	95,825	1.37	2.66	2.01	-44,000	0.48	42.38	10.02	751,079	-3.89	0.32	3.26	-0.45	2.87	524,337	4.17	2.18	-2.33	-15.97
	SE	136,211	0.31	0.91	1.00	260,858	2.09	13.38	3.88	128,032	0.93	0.37	1.13	1.72	0.64	341,165	2.06	0.76	4.97	11.33
	t Stat	0.70	4.43	2.91	2.01	-0.17	0.23	3.17	2.58	5.87	-4.19	0.86	2.90	-0.26	4.45	1.54	2.02	2.87	-0.47	-1.41
	P-V	0.50	0.00	0.01	0.06	0.87	0.82	0.01	0.03	0.00	0.00	0.41	0.02	0.80	0.00	0.16	0.07	0.02	0.65	0.19
	CI (±)	299,799	0.68	2.01	2.20	574,144	4.60	29.45	8.55	289,629	2.10	0.84	2.55	3.89	1.46	760,163	4.60	1.69	11.07	25.24
Over the 2 nd PR	β_k	23,415	1.16	3.94	1.14	-194,076	2.89	7.69	33.93	408,378	-2.49	0.58	1.50	2.19	2.52	829,370	1.79	2.03	-3.21	-17.03
	SE	125,042	0.28	0.84	0.92	152,728	1.22	2.27	7.83	128,377	0.93	0.37	1.13	1.72	0.65	300,676	1.82	0.67	4.38	9.98
	t Stat	0.19	4.09	4.70	1.24	-1.27	2.36	3.38	4.33	3.18	-2.67	1.56	1.33	1.27	3.91	2.76	0.98	3.04	-0.73	-1.71
	P-V	0.85	0.00	0.00	0.24	0.23	0.04	0.01	0.00	0.01	0.03	0.15	0.22	0.24	0.00	0.02	0.35	0.01	0.48	0.12
	CI (±)	275,215	0.62	1.84	2.02	336,153	2.69	5.01	17.24	290,408	2.11	0.84	2.55	3.90	1.46	669,949	4.05	1.49	9.75	22.25
Over the 3 rd PR	β_k	-36,086	1.31	5.28	1.40	-58,019	3.03	42.11	4.56	367,824	-1.45	0.82	1.98	1.96	2.39	1,316,066	-0.51	2.35	-7.42	-16.33
	SE	251,288	0.57	1.68	1.84	202,321	1.62	10.38	3.01	75,214	0.55	0.22	0.66	1.01	0.38	408,903	2.47	0.91	5.95	13.58
	t Stat	-0.14	2.30	3.14	0.76	-0.29	1.87	4.06	1.51	4.89	-2.66	3.76	3.00	1.94	6.31	3.22	-0.21	2.58	-1.25	-1.20
	P-V	0.89	0.04	0.01	0.46	0.78	0.09	0.00	0.16	0.00	0.03	0.00	0.02	0.08	0.00	0.01	0.84	0.03	0.24	0.26
	CI (±)	553,082	1.25	3.70	4.06	574,144	4.60	29.45	8.55	170,146	1.23	0.49	1.50	2.28	0.86	911,092	5.51	2.03	13.26	30.25
Over the 4 th PR	β_k	399,367	0.32	-1.08	0.79	350,633	-1.27	1.70	10.67	445,546	-1.36	-0.25	0.90	1.68	0.39	98,331	1.05	0.68	1.81	1.98
	SE	45,724	0.10	0.31	0.34	61,401	0.49	0.91	3.15	41,271	0.30	0.12	0.36	0.55	0.21	17,593	0.11	0.04	0.26	0.58
	t Stat	8.73	3.09	-3.54	2.36	5.71	-2.58	1.86	3.39	10.80	-4.55	-2.07	2.48	3.03	1.90	5.59	9.88	17.41	7.08	3.38
	P-V	0.00	0.01	0.00	0.04	0.00	0.03	0.09	0.01	0.00	0.00	0.07	0.03	0.01	0.09	0.00	0.00	0.00	0.00	0.01
	CI (±)	100,638	0.23	0.67	0.74	135,143	1.08	2.01	6.93	93,362	0.68	0.27	0.82	1.25	0.47	39,200	0.24	0.09	0.57	1.30

Note: The abbreviations of β_k , SE, t Stat, P-V, and CI in the table indicate the parameter of the related sectors, standard error of the coefficients, t test statistic for the coefficients, the probability of obtaining t test results, and the interval estimation of population parameters, respectively.

Source: TUIK (1997), TUIK (2008), DPT (1999), DPT (2003), and DPT (2007).

the EU.

As focused on integration and interactions through programs among the region groups; the projects in NUTS level-2 regions can be sufficiently coordinated by DPT and the EU via establishing specific bodies among integrated regional projects. Unfortunately, strengthening the interactions among the developed, developing and underdeveloped regions is still out of the program schemes. The geographic locations and sectoral features of NUTS level-2 regions would advance the socio-economic regional homogeneity with the EU grants by shaping out the background of possible and extant regional projects through specific sectors. Therefore, socio-economic homogeneity could be expected to result in regional convergence with long-term solutions by means of integrated regional development projects applied by individual investors.

The difference between short- and long-term solutions is not the matter of time period. Rather, it is the matter of solving the regional problems on their own by means of development programs and/or projects. Although these programs and projects in Turkey are mainly supported by the EU, it never makes them short-term because they are completely related with socio-economic aspect in a different direction targeting at several aspects of societies. It is also difficult to expect that the effects of these projects will be able to continue for much longer years than short-term solutions' because of the insufficient regional program practices.

Even though there is no direct priority in the programs; the program regions have advan-

tages in trade, industry, transportation & communication, business & personal services, ownership of dwelling, and financial institutions to decrease regional disparities. Beside, the findings of Gini index also provided the information about these sectors that should be balanced by regional programs because they have severely aggravated regional disparities in the program regions. It can be simply stated that there is a remarkable difference between grant priorities given by the donor and sectoral needs required by the regions.

Decreasing regional disparities have usually been difficult and complicated in Turkey because the developed regions' sector coefficients will be greater in their regions than their effect over the underdeveloped. Since the growth in the developed regions can not be basically stopped to make the 4th PR catch up, only some interactions like sectoral can be used to make them approximate to each other more closely by merely shortening the time period.

As regional integration has also become one of the goals of Turkey, regional programs require more concentration on structural problems of regional development. To solve spatial disparities such as demographic disparities, economic disparities, and disparities in the infrastructure, Turkey needs a more different direction in regional programs and projects than the current ones. For the possible future improvements, this study can be re-examined in the same perspective for all NUTS level-2 regions that can help to comprehensively understand the sectoral and regional developments in Turkey.

Notes

- 1) GAP Project is a multi-sectoral and integrated regional development project based on the sustainable development components and it is the ninth of ten biggest projects in the world by irrigating 1.7 million hectares of land in the region, constructing 22 dams and 19 hydroelectric plants, and costing about \$ 32 billion (DPT, 2005) .
- 2) There have been a great difficulty in qualified regional data and its availability in Turkey where many researchers have faced in analyses. Only regional GDP per capita (at 1987 constant prices) and regions' sectoral shares in GDP (in purchasers' value) are available till 2001. These data have been reconstructed by the author as sectoral GDP per capita distributions in the regions at 1987 constant prices to eliminate the effects of population distributions and cyclical price increases.
- 3) Several criteria are used by State Planning Organization and Turkish Statistical Institute for dividing Turkish territory into NUTS regions such as population, geography, regional development plans, basic statistical indicators, and socioeconomic development level of provinces.
- 4) The sources in DPT (2007) indicate the same study but different parts (pp.15-17, 22-25, 27-29, 31-33, and 35-36) of 'The New Regional Development Policies and Implementations' published by State Planning Organization, Republic of Turkey.
- 5) The regions' development levels are classified by their GDP per capita distributions. The average GDP per capita is 1,377,940 TL (Türk Lirası) and the standard deviation is 631,846 TL for 26 NUTS level-2 regions among 1987-2001. The interval of developing regions is $1,377,940 \pm 631,846$; and the regions which are lower than 750,000 TL and higher than 2,000,000 TL are classified as underdeveloped and developed regions, respectively.
- 6) The estimation process is first sectoral GDP per capita of a region (as dependent values) is regressed by GDP per capita of Turkey (as independent values) from 1987 to 2001, and the data of GDP per capita of Turkey (it is available) 2002 to 2006 is applied for the linear regression equation year by year. Then, we extended sectoral GDP per capita till 2006 for the region. Second, the same

process is applied for sector shares of GDP per capita of the region. Therefore, sectoral GDP per capita (from 2002 to 2006) of the region became independent values and sector shares were dependent. All process is applied for nine NUTS level-2 regions.

- 7) The Gini coefficient is defined as a ratio of the areas on the Lorenz curve diagram. If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then, the Gini coefficient is $A / (A + B)$. Since $A + B = 0.5$, the Gini coefficient, $G = 2A = 1 - 2B$. In analyzing the regional disparities as a common method,

$$\text{it can be given as } G = \frac{\sum_i^n \sum_j^n |y_i - y_j|}{2yn(n-1)}, \text{ then,}$$

G is the Gini index, y_i and y_j are regional incomes, n is the number of regions (Ozturk, 2005).

- 8) Regional GDP per capita by sectors is the sum of all sectors' contributions to GDP per capita in a specific region and a specific year.
- 9) Others (other sectors) indicate the total value of Private Non-Profit Institutions + Import Duties - Imputed Bank Service Charges.
- 10) Sectoral priorities according to the program regions are Small Scale Infrastructure (X_C), program SMEs (X_B), Technical Support (X_G), and Local Development Enterprises (X_O) in the 1st PR; Small Scale Infrastructure (X_C), SMEs (X_B), Support to Managerial Structures (X_G), Technical Support (X_C), and Local Development Enterprises (X_O) in the 2nd PR; Tourism & Environmental Infrastructure (X_C), SMEs (X_B), and Local Development Enterprises (X_O) in the 3rd PR; Agricultural & Rural Development (X_A), Tourism & Environmental Infrastructure (X_C), SMEs (X_B), Small Size Enterprises (X_B), Technical Support (X_O), and Social Development (X_O) in the 4th PR.
- 11) For the regression analysis, sectoral GDP per capita of the regions in the 1st PR and the 2nd PR is transformed into average values as a project geography because unless it was merged, the data expansion would be too extensive to find the sectoral needs.
- 12) A risky project field emphasizes the contribution of a sector to GDP per capita growth if it has a neg-

ative coefficient (including CI of the parameter) in its implementation region or over an underdeveloped region. A safe project field emphasizes the contribution of a sector to GDP per capita growth if it has a positive coefficient (including CI of the parameter) in its implementation region and over an underdeveloped region. In the case of the coefficient, if it is positive in an underdeveloped region, but it is resulting in a higher coefficient over a developed region, then, it is also described as risky one because it deepens the regional GDP per capita disparities.

- 13) In this paper, t statistics for parameters are utilized to evaluate the intensity of relations between independent variables (sectors) and dependent variable (GDP per capita). $|t| < 2$ is a weak sectoral relationship, $2 \leq |t| \leq 3$ is medium sectoral relationship, and $|t| > 3$ is a strong relationship (Ertek, 2000).

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