Regional Innovation Policy: An Analysis of Turkey's Aegean, Marmara, East Anatolia and Southeast Anatolia Regions

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Abstract : *This paper analyzes the main intuition behind the concept of Regional Innovation System (RIS) and the corresponding policy implications in a literal notion. The aspects that are the reasons of regional disparities in terms of innovation such as clusters, agglomerations, research and development (R&D) will be investigated via observing whether development agencies, clusters, industrial zones and universities which overall are contributing factors in regional development exist or not. Aligned with these aspects, this paper analyzes the reasons for the disparities between regions. Consequently, policy approaches and innovation strategies towards the regions that are distinguished due to disparities (as peripheral, metropolitan and industrial regions) will be presented. The following will constitute of the analysis of Turkey's Aegean, Marmara, East Anatolia and Southeast Anatolia regions with respect to the results reached in the prior analysis. The objective is to investigate the characteristics of the corresponding regions and determine the aspects for the developmental gap between them. The policy applications regarding regional innovation systems, the effects of universities in the mentioned regions and the adopted policies within the process of EU membership are presented. The literal analysis indicates that although in the recent years there have been improvements regarding regional development, previously it has been the western regions that received the most attention. These findings could be verified in a further research with a thorough statistical analysis using regional data on labour productivity, capital investment, expenditure on R&D, registered patents and economic growth.*

Keywords : Turkey, Regional Innovation Systems, Cluster

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Introduction

Since the topic was undertaken in the early 1990s the literature on regional innovation systems (RIS) have accumulated and constituted a base for research. One among the many empirical studies about RIS is the Cooke's study, which focuses on regional innovation within Europe.[1] The awareness of this topic in the economic literature has increased in the recent years with the enhanced competitiveness, economic interdependence, globalization and regionalism. The increasing intensity in globalization and global competition has been aspects underlying the increased popularity of the concept of regional innovation systems[2].

The popularity of the subject can also be witnessed in various empirical studies such as the "Nordic Cluster" [3] case and in another study which focuses on the disparities between regions and their characteristics and concludes that there is no "one size fits all" [4] policy for regional development. Furthermore, another case specific study concerning RIS and its implications dwells on the national industry clusters and regional specialization in Turkey is National Industry Clusters: The Case of Turkey.[5]

In the recent years, the main development indicator has become innovations as well as knowledge, research and development (R&D) and know-how. Countries that create knowledge, in other terms trade innovations, patents and technology are considered to be the leaders of the world economy. Despite their land boundaries, Japan has become to be known as the base for technology. The investments made on innovation have indeed paid off for Japan.

Prior to the conclusion, the literature is analyzed for Turkey's Eastern and Southeastern Anatolia, the Marmara and the Aegean regions. The first two regions are considered to be the least developed regions of Turkey while the last two regions are the most developed ones. There are many reasons such as political instability, historical background, natural resources, demographic infrastructure and education levels to point out the regional development differences. These reasons may all have an effect on the region or, it would be wise to think that it is probable that none of them have an effect whatsoever.

Regions can be determined based on different characteristics such as natural resources, population, religious motives, easy transportation and maintaining a higher living standard. In this point of view, one can determine the world as being a huge region that is formed of numerous sub regions (countries), which also have sub regions (cities) and it continues until it reaches to a simple small village. It is logical to think that every sub region develops in itself to promote to a higher sub region.

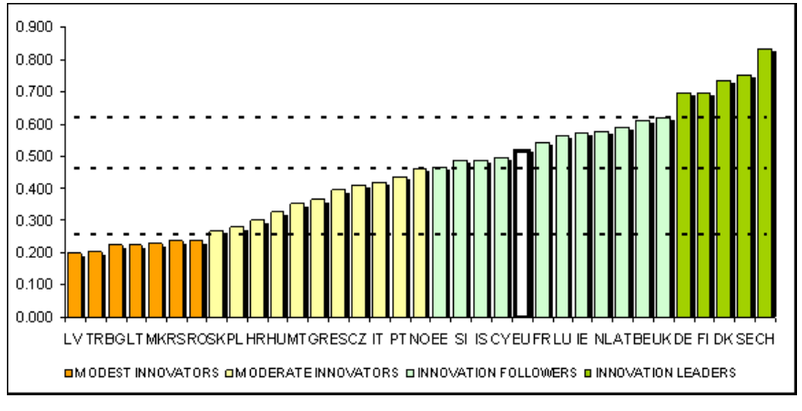
Regions are separated into three groups[4]: peripheral regions, old industrial regions and metropolitan regions. Although they are analyzed thoroughly, basically, peripheral regions are those which are weakly developed in which innovations and R&D activities are below average. The second region type, old industrial regions are highly developed in mature industries which have high specialization. The third type, the metropolitan regions are regions which experience high innovation, knowledge externalities and agglomeration economies.

The liberalization process which started after the Second World War and became more popular following the disintegration of the Soviet Bloc, have altered the way of living. Trade, as stated by Heckscher-Ohlin or Adam Smith, is not based on factor endowments, comparative or absolute advantages concerning goods or labor anymore, but rather on the creation of knowledge and innovation.[6] Regions that create knowledge, promote innovations and invest on learning have become the agglomeration places for industries.

Overall, putting new ideas in life and through it, establishing new technologies is the way to empower economic growth. New technologies and improved production trigger competitiveness between industries, which derives them to enhance their innovation capacities. As a result, these developments improve the production process, total factor productivity and efficiency, which will eventually lead to regional development.[7]

The following figure 1[1] demonstrates the innovation performance of the European countries where Turkey is indexed as TR and is situated below the overall EU innovation level. The leading countries in innovation are Denmark, Germany, Finland, Sweeden and Switzerland as the overall innovation leader.

Figure 1 European Countries' Innovation Performance



Source: PRO INNO EUROPE, 2011.[8]

The figure demonstrates Turkey's state of innovation compared to other European countries and presents the leading innovator countries.

Regional Innovation Systems

Regional Innovation Systems is the idea to adopt various innovations, or more general, development policies, in a specific region for the purpose of economic growth. These policies all together constitute the system to enhance the region's production capacity, competitiveness and market size which are formed by clusters and industrial zones. Clusters and industrial zones are sub regions in which innovation, agglomeration of competing or substituting industries and R&D take place.

Adam Smith, in his pioneering work Wealth of the Nations[9] demonstrates that through specialization, production capacity could be enhanced. During his time of study, the factor of production was the intense use of the labor force. Needles to say, logically the route to economic growth were thought to be adopting policies towards labor production. However, the globalized economy today requires rather different and more complex policies in order to promote economic growth. That is why, for the last decades, economists are dwelling upon the concept of regional development.

The articles on RIS by Philip Cooke have been one of the major studies in this area which has established the main skeleton of the idea behind regional innovation.[10] The study of Cooke demonstrated that the existence of the one size fits all problem could be surpassed by developing region specific policies. "RIS thinking recognized from the beginning the diversity of regional innovation characteristics of business and regional governance competences and capabilities and advocated diverse policy responses accordingly." Furthermore, Franz Todtling and Michaela Trippl 2005 clarify the notion of one size fits all problem and the policy. In their study Todtling and Trippl have made an attempt to show that there is no "ideal model" for innovation policy as innovation activities differ strongly between central, peripheral and old industrial areas. [11]

Regional Differences in Innovation Performance

Although there exist numerous different aspects that cause regions to differ from one another ranging from geographic to demographic characteristics, this part of the paper dwells upon the differences in the framework of RIS. The main difference between regions that affects their innovation performance is the existence of clusters and its structural outcomes, R&D, knowledge creation and knowledge spillovers.

Clusters, in the most common understanding, are the agglomeration of interrelated industries in a specific region or location. The main intuition behind this kind of an agglomeration depends on various dimensions such as input-output relations between firms, the geographical location, industrial composition, natural resource endowments of firms, target markets and the existence of competing

industries. The basis of clusters is mutual attraction, in other words, the system of external economies of scale. It is the benefits of unity or competition which outweigh the drawbacks of repulsion that agglomerates industries.[12]

The well known example of an industry cluster is the Silicon Valley. The idea was to use the valley as a land for offices that would create local employment. One of the first companies established in the valley was the Hewlett-Packard which was founded by two local graduates of Stanford University. Hewlett-Packard was one among the many companies of the valley that turned out to become a major success story. Consequently, as the companies became successful so the valley became attractive for start-ups. The valley had started to create knowledge, qualified labor, technology and R&D; thus, it became a perfect industry cluster in high-tech industry.

Economic growth or more specifically, sustainable economic growth can be reached via increasing production. Furthermore, to increase production, there are two policies, one of them is increasing the amount of the labor factor and the other is increasing the use of the capital factor. Apart from these policy tools, there is also another more efficient way of increasing output which is improving the productivity of labor or capital. Increasing the productivity of labor can be reached through education; more skilled and educated labor will be more productive. On the other hand, innovation and R&D is the way to improve capital and make it more productive. Industry clusters in this sense create knowledge, promote R&D and innovation. Consequently, industry clusters establish a knowledge base and via external economies of scale they enable the distribution of knowledge.[13]

The existence of clusters in a region will reduce the amount of negative externalities and create a sound structure to be resistant against external shocks. As Coase states in his article, the actors can overcome externalities if there is no transaction cost.[14] In clusters, firms can reduce the negotiation or transactions cost and eliminate any externality, which eventually increases production.

Overall, the main contribution of clusters to regional economic development is through creating an environment of knowledge and innovation, which increase the productivity. On the other hand, the interaction of these clusters with the neighboring regions through means of trade or factor movements help enhance the range of knowledge, which is basically named as knowledge spillovers.[8]

Knowledge spillovers could take place at internal industry level or the external level. Industries located in the same cluster or region may engage in transactions resulting in internal knowledge spillovers. On the other hand, industries that engage transactions with those that are located outside the cluster or region will result in external knowledge spillovers. Under both terms, the overall expectation would be increasing efficiency. However, knowledge spillovers will create a positive externality as long as the spreading of knowledge contributes to the production efficiency.

Innovation Strategy and Policy Approaches

As mentioned above, the peripheral regions are those which are weakly developed and conduct below average innovations and R&D activities. Furthermore, peripheral regions are not developed in terms of clustering and instead of improving the production itself. It is rather the production process which is mainly the concern. Thus, the policies are towards the development of the production process which does not completely contribute to the regional development. Yet, the industries are left to stay at the industrial level and are not able to catch up with the globalized market production. The main element in the peripheral region is the Small and Medium Size Enterprises (SME).

One of the main concerns of an SME is to maintain their state in the market and balance their account. Nevertheless, SMEs prefer strategies that increase their production and their profit. Nonetheless, this kind of an approach can operate in the short run and at the inter-industry level. Because, the level of development does not expand to a higher (external) level, as a consequence, interregional knowledge spillovers as well as public innovation funds cannot be absorbed to a sufficient extent in such regions.[15]

The main point is to apply the right policy to the right region. Thus, in the light of the aforementioned problems of the peripheral regions, one can analyze a set of various approaches towards solution. Since the main concern has been to improve the production process which turns out that it is not a proper idea for regional development, the main policy to be implemented could be to concentrate on the product innovation, R&D and expanding the knowledge base. Clustering could be a route to achieve this policy, in that SMEs can be located in one region namely the Organized Industrial Zones (OIZ) such as the OSTIM (Middle East Industry, Trade and Business Centre) which was established in Ankara.[16]

These OIZs constitute the backbone of the overall production, employment, capital and innovation. Promoting such clustering in the region, and funding product innovation, as well as R&D, could increase the velocity of the development process. In this perspective, peripheral regions obtain the potential of transforming from an underdeveloped region to an innovative, well qualified, knowledge creating and a developed region.[17]

Industrial regions, contrary to the peripheral regions, are developed around the average, yet insufficient in terms of innovation and R&D. In contrast to peripheral regions, where the lack of clusters appears to be an important development barrier, old industrial regions face the opposite problem of too strong clustering as they are overspecialized in mature industries experiencing decline.[18] What Todtling & Trippl refer to as a problem is that the too strong internal structure of clusters prohibits it from the knowledge and innovations of the outer market. The main contribution of clusters to the regions as mentioned above is the idea of mutual attraction.

In the loss of mutual attraction, these highly specialized industry clusters become closed and in the long run, these clusters lose their competitive structure. Competition is mainly the trigger of product differentiation therefore innovation and R&D. Without competition, the firms in the industrial regions will have no incentive to differentiate or develop their production and eventually they will have the same kind of technology and means of production. If the firms in the industry do not engage in such innovation strategies, no individual firm will, because it will be costly.

If the industrial region is abundant in one industry, the global shocks will have severe effects on the region's economic structure. For example, the country of Iceland has an abundance of banking sector and it would be wise to say that Iceland has a banking cluster. The global financial crisis that started in 2007 and continued on in 2008 and 2009 nearly bankrupted the whole country. Although this is an extreme example, it shows the effects of an economic shock if the region is abundant only in one industry.

The policy implications towards the industrial regions would be to open the clusters to the global market to promote competition. Another policy could be government controlled funding for product innovation to convert the old industry structure to new industries. Due to the loss of interaction between the industries in the region, the funding might not reach all the levels. However by the government intervention, these negative effects could be surpassed. One other policy to be addressed is to diversify the industry clusters in the region to prevent any economic downfall or decrease the impact of a sectoral economic crisis on the region.

Metropolitan regions are regarded as centers of innovation, benefiting from knowledge externalities and agglomeration economies.[19] From this understanding, one could say that metropolitan regions are those which have successfully adopted resolution policies of the peripheral and old industrial regions. The main goal for the other regions is to reach the level of metropolitan regions.

The intuition behind metropolitan regions is that due to the large number of universities, research facilities, government institutions, private institutions and large population, these regions are the centers or more precisely, the origins for R&D, knowledge creation and innovation. First and the foremost important aspect of a metropolitan region is its capability of interaction, transfer of knowledge and dynamic structure. Positive externalities which all the industries and individual firms benefit are created in such a dynamic, interactive environment. "Some research on metropolitan innovation system has concluded that metropolitan areas are the most important location for innovation or that they have high innovation potential because they offer firms spatial, technological and institutional proximity and specific resources."[20]

The definition states that metropolitan regions are the most effective region type; however, there still remain some problematic topics for some metropolitan regions. One topic could be integration problem which can also be referred to as

global integration. That's as to say, the policy towards metropolitan regions should address the global integration issue. It could be lifting the trade barriers, granting subsidies or lifting customs taxes. Liberalization of trade in a region could promote global integration in that region. Nevertheless, the region should be strong enough to be able to compete in the international market.

In the following part of the paper, taking Turkey as a case, some of the factors that contribute to regional innovation are presented. The regional development agencies, the existence of universities and policy implications in the EU accession process are the following topics.

The Policy Implications in Turkey
Regional Development Agencies

Regional development agencies were established with the act number 5449 ratified in 2006. The first article of the act 5449 clearly states why the regional development agencies were established. The article 1 is as follows: "to develop the cooperation between governmental, private and non-governmental institutions, to ensure that resources are used efficiently and properly, to accelerate regional development as prescribed in the national development plan and programs in accordance with the principles and policies by arousing the regional potential, to ensure sustainability and to decrease the disparities within and between regions". Among the 27 regional development agencies in Turkey, 10 have already been established in accordance with the above articlRegional development agencies as mentioned in the article 1 target regional development at the basic. In this sense, establishing agencies can contribute to the RIS by developing the cooperation, decreasing the inefficiency in the resource usage and aligning with the activities of the sectors so as to create a knowledge base. Moreover, the main intuition behind the policy of establishing regional development agencies is to create specialization. Every individual agency is specialized in one specific region which grants them the opportunity to decrease the information asymmetry within the region. Furthermore, all the regional development agencies report to the State Planning Organization (SPO) which enables cooperation between the regions to increase and maintain a sound structure under the control of the government.

The roles of regional development agencies can be summarized as; increasing investment by identifying the necessary areas and finding adequate funding necessary; improving the infrastructure by investigating and determining the problematic areas; increasing mobility, transport and communication through establishing interaction between firms, the local people and the government; increasing the cooperation and participation between the people by developing regional projects that include the locals as participants and increasing the awareness and consciousness by giving seminars and pointing out the problems of the region.[22]

A well organized, well working agency contacts with nearly every firm,

institution (governmental or not) and organization. Through this kind of interaction, agencies gather the region's information and consequently analyze this data to point out the problematic areas and introduce the most suitable policy towards that region. The results of these policy implications can be better observed in the long run and since regional development agencies have a short history in Turkey, it cannot be possible to clearly identify the ramifications of the agencies. On the other hand, it would be wise to expect that regional development agencies, under decent administrations, will perform competently, since Turkey has a dynamic and developing structure.

Effects of Universities in Terms of Knowledge Generation

Knowledge is a derivative of human capital in a way that the labor with the adequate knowledge is considered qualified and the one with inadequate knowledge is called unqualified labor. In today's world, it is the qualified labor that contributes more to the economic growth due to the fact that today is the age of technology and knowledge. When we look at the country profiles, the strongest economies such as the US, Japan, Russia and the EU are those that create and trade knowledge. One of the main aspects of knowledge creation is the existence of universities in good quality. It is a known fact that the developed countries pull the qualified labor which is also called brain drain. For countries with universities of good quality, brain migration is a positive externality; on the contrary, it is a negative externality for the poor ones.

Besides creating a qualified labor force for the country, on the regional level, the existence of a university brings about students that create extra demand for the region. A hypothetical student who travels to a region for the purpose of decent education will have demands from settlement and food to entertainment. When a university is established in a region, there will be need for dorms, rentable houses, catering places, entertainment places and shopping malls. These will create employment for the regions' labor, rent for the house owners. Needless to say, the university will be an aspect that can trigger economic refreshment in the region.

Moreover, even though the existence of universities could contribute to economic development, this contribution would not be able to expand to a macro level. In order for the universities to effect the economic growth in the region, there should be strong links and interactions between universities, government and the private sector. Being the source of knowledge, universities and their research facilities could be a major contributor to the enhancement of the production via research and innovations." Moreover, clusters which have this kind of a structure are comparably more successful than the rest. In the case of an analytical (science-based) knowledge-based cluster, it is a question of promoting new economic activity, requiring close and systemic industry–university co-operation and interaction in the context of, e.g. science parks and incubator centers"[23].

Policy Implications in EU Accession Process

Since the establishment of the Republic of Turkey, the major goal has been to reach the levels of the modern civilizations. There have been various routes in this regard and one of them is the ongoing EU accession process. Since the entry into force of the Ankara Agreement in 1963, Turkey has undergone a set of political, constitutional overall structural changes. The most significant progress has been the completion of the Customs Union, which in general enabled free trade with the EU countries. Furthermore, there have been some obstacles for Turkey in the way of becoming a full member, such as fulfilling the Copenhagen and Maastricht Criteria. The Copenhagen Criteria constitutes generally the political requirements towards becoming a full member.

For regional development, one of the major policy implications is the Nomenclature of Territorial Units for Statistics known as NUTS. The Nomenclature of Territorial Units for Statistics (NUTS) was established by Eurostat more than 30 years ago in order to provide a single uniform breakdown of territorial units for the production of regional statistics for the European Union.[24] Along with the membership process, Turkey adopted this policy in 2002 with the additional sentence to the decree 4720. Article 1 of the decree 4720 states that NUTS has been introduced overall the country to create a comparable statistics database which will align with the European Regional Statistic System and determine the framework of the regional policies, analyze the regional socio-economic structure, gather and develop statistical data.[25]

In accordance with this regulation, three region levels have been defined in Turkey as NUTS 1, 2 and 3. NUTS 1 constitutes of 12 regions, NUTS 2 is 26 the sub regions of NUTS 1 and NUTS 3 is the overall 81 provinces[26].

In addition, the regional development agencies as mentioned above are the results of this division of regions, in that the 26 regional development agencies planned to be established are located based on NUTS 2 regions.

The Expectations and Effects of RIS in Turkey

This paper has analyzed the intuition behind RIS and the policy implications in Turkey. Consequently, the aim of the paper is to specify the RIS policies to four regions of Turkey, which are the Marmara, Aegean, East and Southeast Anatolian regions. The main reason for these specific regions is that these are the most and least developed regions of Turkey. The Table I presents the development levels of the regions of Turkey.

Marmara Region

The Marmara region constitutes of the following provinces, Balıkesir, Bilecik, Bursa, Çanakkale, Edirne, İstanbul, Kırklareli, Kocaeli, Sakarya, Tekirdağ and Yalova. The development levels of the provinces are all above the average of Turkey, as can be seen in table II. These provinces and the overall region have deep historical roots which obtain the identity of a developed region. That's to say, the region was the capital for the Byzantine, the Ottoman and many other civilizations. Moreover, its geographical location is of unique identity, connecting the Mediterranean and Black Sea by the Bosphorus, and constituting the characteristics of a natural bridge between the continents of Europe, Middle East and Asia.

The region, building on its historical strength has developed to become Turkey's largest and the most significant region. The region has an industrial and trade based structure which constitutes more than half of the whole of Turkey. In other words, there are about 5,608 small and large scale manufacturing firms that exceed half the number of all 11,118 firms in Turkey. Furthermore, the region has also been developed in many other sectors from education, health to transportation.[27]

In the light of the previous assertions, it would be wise to state that Marmara region shows the characteristics of a metropolitan region and an old industrial region. Due to the fact that there is adequate development in the industry level, and for some of the provinces it has been integrated in to the global economy. On the other hand, the region lacks the diversification in clustering and faces the problem of high rates of inward migration. The inadequate clustering decreases the sound structure against sectoral economic downfalls. In other words, there is no other sector that could compensate the regions overall well being. This could be solved via creating dynamic clusters in different industries and strengthening the already existing links between universities and R&D institutions.

The inward migration does not require a policy approach towards Marmara region. On the contrary, the focus should be on the regions that outward migration takes place. In general, it would be logical to think that if the region facing outward migration is as well developed as the Marmara region, why would people migrate in the first place. Therefore, the policy approach towards Marmara region should be enhancing the innovation capacities and establishing clusters that would strengthen the economic infrastructure.

Aegean Region

The Aegean region is the second most developed region after Marmara region and it constitutes of the following provinces, İzmir, Manisa, Aydın, Denizli, Muğla, Afyonkarahisar, Kütahya and Uşak. Except Kütahya and Afyon, all the other provinces are above Turkey's average in terms of development levels shown in Table III. The Aegean region obtains an industrial and trade based structure like the Marmara region. However, it is the second largest in these aspects. In addition, the modernized agriculture is one of the major sectors in the region and it is the second in terms of per capita production after Central Anatolian region. Furthermore, the Aegean region in the recent years has concentrated on establishing OIZs. However, it is the second after the Central Anatolian region. All these and other characteristics of the region ranging from health to transportation are above Turkey's average yet still insufficient.

Within this context, it would be logical to think of the region as an old peripheral region and in some parts a peripheral region. As in all other factors, the problems of the region are also somewhat similar to that of the Marmara region. The absence of interaction between universities and government, which is an important aspect in creating knowledge base, in return disables to implement relevant RIS policies. To solve such a problem, the already existing Izmir Development Agency should be more active in strengthening the interactions and defining the problematic areas in the region.

The technology clusters that have been established should be supported by the government and the private sector to create a proper environment for innovation. A further policy could be to enhance the structure of OIZs to establish clusters such as the OIZs in the Central Anatolian region.

East Anatolian Region

According to the socio-economic development indicators, the East Anatolian region is the least developed part of the Turkey as shown in Table I. The region constitutes of the following provinces, Ağrı, Ardahan, Bingöl, Bitlis, Elazığ, Erzincan, Erzurum, Hakkari, Iğdır, Kars, Malatya, Muş, Tunceli, and Van. Table V shows the development levels of these provinces, which can be observed that Elazığ is the most developed while Muş is the least developed province in the region.

According to the sectoral labor shares, the region represents an agricultural economic structure with around 66, 41 percent of the labor force working in the agricultural sector. In addition, even though at this rate the contribution of the region to Turkey's overall production is only 9, 5. The numbers mean that although the region has a high labor force in agriculture, the production is not efficient.

Otherwise, it would have a higher contribution rate to the overall production. Nevertheless, in underdeveloped regions such as the East Anatolian Region, policies that can redistribute the excess labor to alternative sectors and policies that targets modernization of capital could enhance the regional production capacity and contribute to its development.[28]

On the other hand, the region is one of the major suppliers of hydroelectric energy as shown in the Table VI. The dams build on the Euphrates and Tigris Rivers are the most significant electric energy producers. Furthermore, the region owns the richest mines and mineral resources in Turkey. However, not all of these resources are used or implemented into production efficiently.

In this regard, the East Anatolian region could be defined as a peripheral region, which is underdeveloped and has inadequate innovation, research and development. Therefore, the policy approaches should address these issues primarily. Before dwelling on topics such as creating cluster or maintaining links between universities, the private sector and the government, the most significant aim should be developing the infrastructure of the region. Roads, schools, public education centers and hospitals should be established to promote the living standards in the region.

Upon solving these issues the region would not have high rates of outward migration compared to other regions. The ramifications will be a positive externality to the regions which are the destination of the migrants. Especially, preventing the outward migration in the East Anatolian region and turning the destination to development centers that will be selected inside the region will contribute to regional development.[29] In this framework, the East Anatolian Project (EAP) has been implemented with the coordination of the universities and the SPO, with the aim of triggering the local potential of the region to increase development. In this project, the major problematic issues in the region, from education, health to transportation, have been determined along with the proper policy approaches. Based on the large extent of the EAP, it requires a more specific and wide range of study which exceeds the focus of this study.

South East Anatolian Region

The South East Anatolian region as shown in the Table I, is the sixth developed region in Turkey which constitutes of the provinces, Gaziantep, Kilis, Diyarbakır, Adıyaman, Şanlıurfa, Batman, Siirt, Mardin, Şırnak. The development levels of these provinces are also in the Table IV, which presents that Gaziantep is the most developed and Şırnak is the least developed province, and except Gaziantep all the other provinces are below Turkey's average.

When analyzed in terms of sectoral labor shares, like the East Anatolian

region, the region has an agriculture intense structure, employing the 61,35 percent of overall labor force. In terms of educational indicators, the region is the least developed almost in every aspect. Furthermore, the situation does not differ when the health sector is analyzed.[11] Although the region is overall at the sixth or seventh in terms of development indicators, it is Gaziantep which pulls the region with its above the average development.

Much like the East Anatolian region, the South East Anatolian region could also be considered as a peripheral region which primarily needs attention in terms of infrastructural development rather than, innovation or R&D. The regions' infrastructure has been damaged due to the political instability and terrorist activities for over 20 years. The major reason for the regions underdevelopment could be its unsecure environment, which attracts neither the private sector nor the individuals. Because of the conflicts, the region does not have adequate schools, hospitals, teachers, doctors and other relevant qualified human capital.

In the light of the foregoing, the government in 1989 with the Act 388, has put into affect the most significant and major project in Turkey the South East Anatolian Project (SEAP) and established SEAP Regional Development Agency. The SEAP constitutes of several sub project concerning, dams, hydroelectric centrals, irrigation systems, agricultural infrastructure services, industrial development, education, health and other sectoral projects. The SEAP is an ongoing project, which is believed to contribute to the regions overall development.[30]

Conclusion

Throughout this paper, the concept of RIS and regional development has been analyzed. Furthermore the related sub topics such as region, innovation, clusters, research and development and knowledge spillovers have been defined. Moreover, the paper has dwelled on the theoretical background of RIS and the literature. Region types such as peripheral, old industrial and metropolitan have been presented along with the proper policies and strategies towards these specific regions.

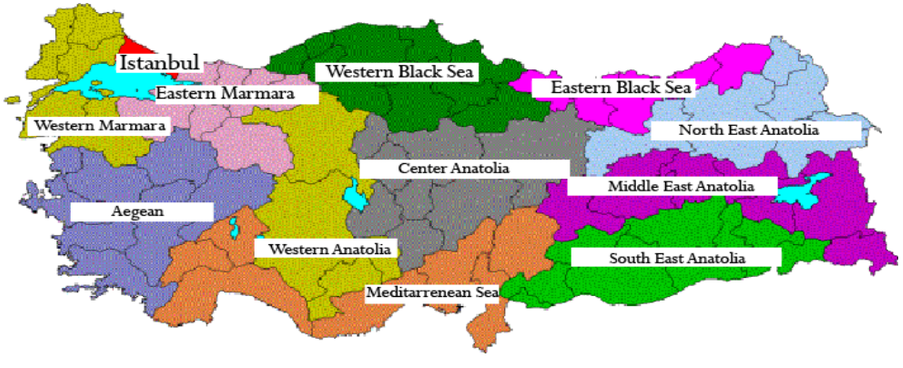
The paper has investigated the case of Turkey in general by focusing on development agencies, universities and policies towards accession to the EU. In addition, the paper has turned its attention to the two most and another two least developed regions. The characteristics of these regions have been studied to reach a region specific policy approach, with the aim of extending their innovation capacity and knowledge production. Prior assessment about these regions has been that the most developed regions which can be considered as both metropolitan and old industrial have already reached a level of development yet require new innovations and industry clusters that can trigger economic growth. On the other hand the two least developed regions which can be considered as peripheral regions require a rather different approach which should primarily target infrastructural development.

Unless the base level of the region does not develop the innovation policies could be irrelevant due to the fact that the absorption capacities of the industries are not sufficient enough.

Even in a fundamental study such as this, it is crystal clear that every region, location or area has its own unique characteristics which require region specific attention and focus. Although innovation and R&D are the most significant topics of the global economy, without taking the preliminary steps and required measures to prepare the economy, in other words, enhance the absorption capacity, RIS might not give the expected results. On the other hand, for a better conclusion about the study of RIS, the topics addressed in this study could be applied to some of the regions at the industry level. With an application and statistical analysis using the data of labour productivity, capital investment, expenditure on R&D, registered patents and economic growth, these results would be rather more solid.

FIGURES AND TABLES

NUTS 1 (12 Regions)

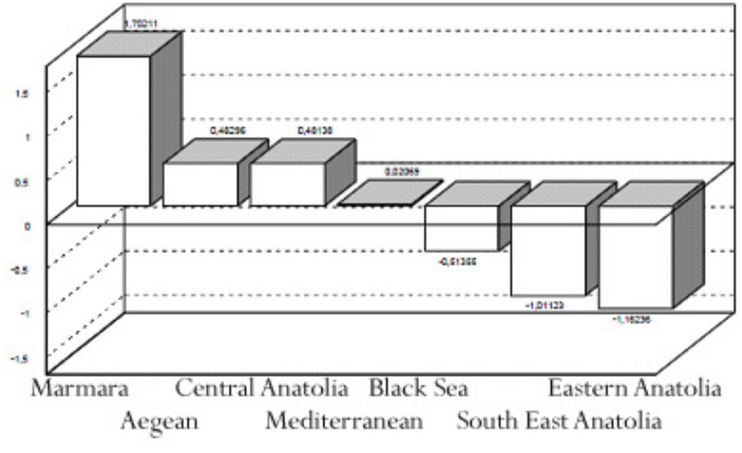


Source: State Planning Organization[31]

NUTS 2 (26 Regions) [20]

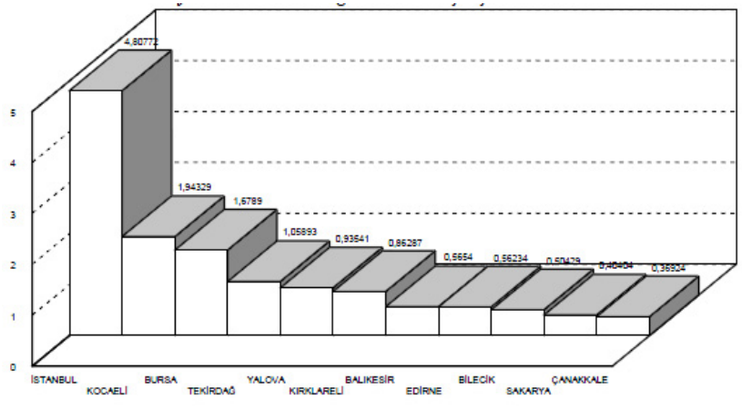
Source: State Planning Organization[32]

Table I: Regional Development Levels According to the Socio-Economic Development Index



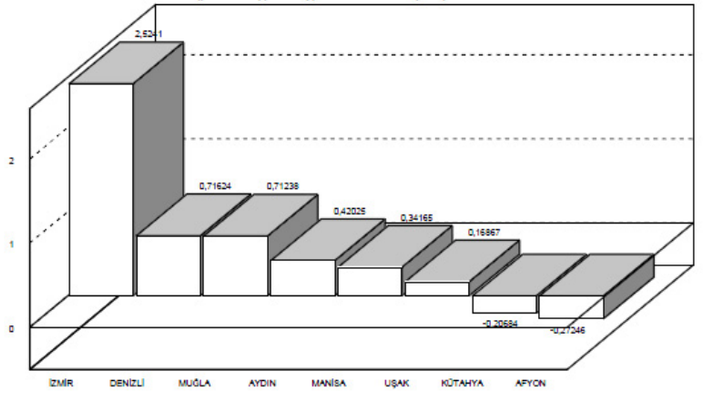
Source: State Planning Organization[33]

Table II: Development Levels of the Provinces in the Marmara Region[31]



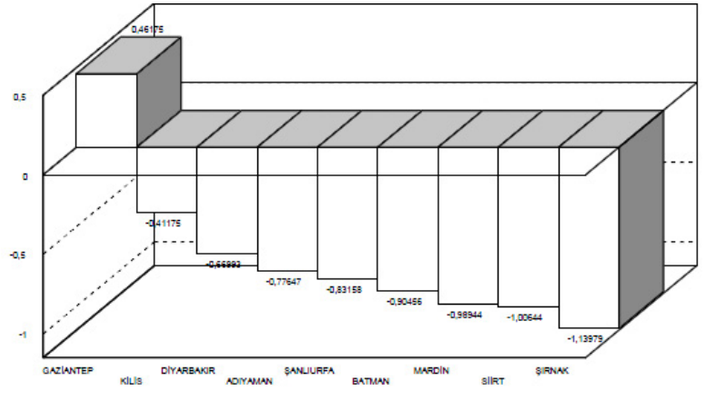
Source: State Planning Organization[34]

Table III: Development Levels of the Provinces in the Aegean Region



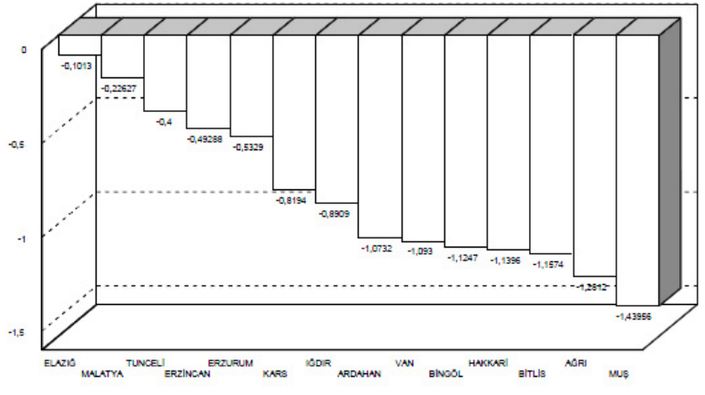
Source: State Planning Organization[35]

Table IV: Development Levels of the Provinces in the South East Anatolian Region



Source: State Planning Organization[36]

Table V: Development Levels of the Provinces in the East Anatolian Region



Source: State Planning Organization[37]

Table VI: Hydroelectricity Production

BASIN	AVERAGE FLOW	STOCHASTIC COMPUTATION (DSI)				CONTEMPORARY COMPUTATION		
		Technical Potential	Feasible Economical Potential	Installed Capacity	Technical Potential usage ratio	Feasible Economical Potential	Installed Capacity	Technical Potential usage ratio
	million m³/ year	GWh/ year	GWh/year	(MW)	%	GWh/year	(MW)	%
Euphrates	31.61	84,112	37,961	9,648	45.13%	46,267	11,713	55,00%
Tigris	21.33	48,706	16,751	5,051	34.39%	24,353	6,165	50,00%
Eastern Black Sea	14.9	48,478	11,062	3,037	22.82%	24,239	6,136	50,00%
Eastern Meditarrenean Sea	11.07	27,445	5,029	1,390	18.32%	12,350	3,127	45,00%
Antalya	11.06	23,079	5,163	1,433	22.37%	9,231	2,337	40,00%
Western Black Sea	9.93	17,914	2,176	624	12.15%	7,166	1,814	40,00%
Western Meditarrenean Sea	8.93	13,595	2,534	674	18.64%	6,118	1,550	45,00%
Marmara	8.33	5,177	……	……	……	……	……	……
Seyhan	8.01	20,875	7,571	2,001	36.27%	9,394	2,378	45,00%
Ceyhan	7.18	22,163	4,652	1,413	20.99%	9,973	2,525	45,00%
Kızılırmak	6.48	19,552	6,320	2,094	32.32%	7,821	1,980	40,00%
Sakarya	6.4	11,335	2,373	1,096	20.94%	4,534	1,133	40,00%
Çoruh	6.3	22,601	10,540	3,134	46.64%	12,431	3,108	55,00%
Yesilırmak	5.8	18,685	5,297	1,259	28.35%	8,408	2,129	45,00%
Susurluk	5.43	10,573	1,602	507	15.15%	2,643	669	25,00%
Aras	4.63	13,114	2,287	588	17.44%	5,901	1,494	45,00%
Konya Closed Basin	4.53	1,218	104	32	8.54%	104	32	8,54%
Büyük Menderes	3.03	6,263	831	221	13.27%	831	221	13,27%
Van Lake Closed Basin	2.39	2,593	257	62	9.91%	257	62	9,91%
Northern Aegean	2.09	2,882	42	16	1.46%	42	16	1,46%
Gediz	1.95	3,916	243	94	6.21%	243	94	6,21%
Meriç Ergene	1.33	1,000	……	……	……	……	……	……
Küçük Menderes	1.19	1,375	143	48	10.40%	143	48	10,40%
Asi	1.17	4,897	102	37	2.08%	102	37	2,08%
Burdur Lake Basin	0.5	885	……	… …	……	……	……	……
Akarcay	0.49	543	……	… …	……	……	……	……
Turkey Total	**186.06**	**432,976**	**126,109**	**35,529**	**29.13%**	**192,551**	**48,768**	**44,47%**

Source: http://www.hesiad.org.tr/hid_pot.htm[38]

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