

COMPETING REGIONAL DEVELOPMENT DISCOURSES: CONCEPTUAL FOUNDATIONS, AND THE RECENT EVIDENCE

Hüseyin Çiçek¹, Ayda Eraydin²

Abstract

Over the last few decades, the regional development discourses and theories have changed substantially, parallel to changes in the economic regimes in world. The shift from the traditional regional development theories, which focused on industrialisation efforts via large-scale enterprises and transfer of central government funds to disadvantaged regions, to regional development based upon endogenous capabilities and potential of innovation and knowledge creation.

This paper provides an overview of the theoretical literature on regional economic growth and examines its conceptual foundations, major competing paradigms, and aims to discuss and evaluate the explanatory power of different theoretical frameworks to explain the growth of regions in Turkey in the recent period. In order to achieve this aim, after deciphering and concretising various classical and contemporary regional economic and territorial models, the paper introduces the studies on the evaluation of three main types of approaches to regional development namely external state support, development based upon local dynamics and knowledge based economy in the Turkish regional/provincial context.

Using the panel data on 81 provinces and annual figures from 2005 to 2008, the research evaluates the regional models with more explanatory power compared to the others. The findings are important to discuss effect of the contemporary theories that emphasize the endogenous factors.

1. Introduction

The regional development discourses and theories have changed substantially, parallel to changes in the economic regimes in world. The shift is mainly from the traditional regional development theories to regional development based upon endogenous capabilities and potential of innovation necessitating knowledge creation.

This paper aims to discuss and evaluate the explanatory power of different theoretical frameworks to explain the growth of regions in Turkey. In this context, paper firstly provides an overview of the theoretical literature on regional economic growth and examines major competing paradigms. Later, regional development policies of Turkey are encapsulated. After giving hypothesis of the paper in the fourth section, in the fifth section empirical model design is explicated. Main characteristics of variables used in the econometric analysis are

¹ Dolsar Engineering, Ankara, Turkey - hcicek@dolsar.com.tr

² Middle East Technical University, Ankara, Turkey - ayda@metu.edu.tr

briefly explained in the next section. Model results are explained in the seventh section. Finally main findings of the paper are summarized in the conclusion section.

2. Development Theories

Regional development theories were built up by perception and representation of current socio-economic environment; assumptions on society, individual and market; objectives and policy tools. Regional development paradigms have evolved parallel to the changes in these concepts. Three paradigms define the regional development history spanning from post-war years towards the contemporary world (Eraydın, 2004; Tekeli and Pınarcıoğlu, 2004).

The first paradigm that had been the basis of the theories and policies in regional development up to the 1970s crisis was parallel to national economic development discourses dominated by planned development idea in the Keynesian welfare state period. The 1970 crisis became the turn of the policies that emphasised market dynamics and competitiveness as the source of growth. In this era, local production dynamics and to achieve competitive advantages by the use of local capabilities were underlined. The increasing forces of globalization in 1990s caused to birth of the third paradigm, which has been developed around knowledge economy concept.

The context of regional development approaches that is also defined by mode of regulation, regime of accumulation and mode of production in three periods are summarized in Figure 1.

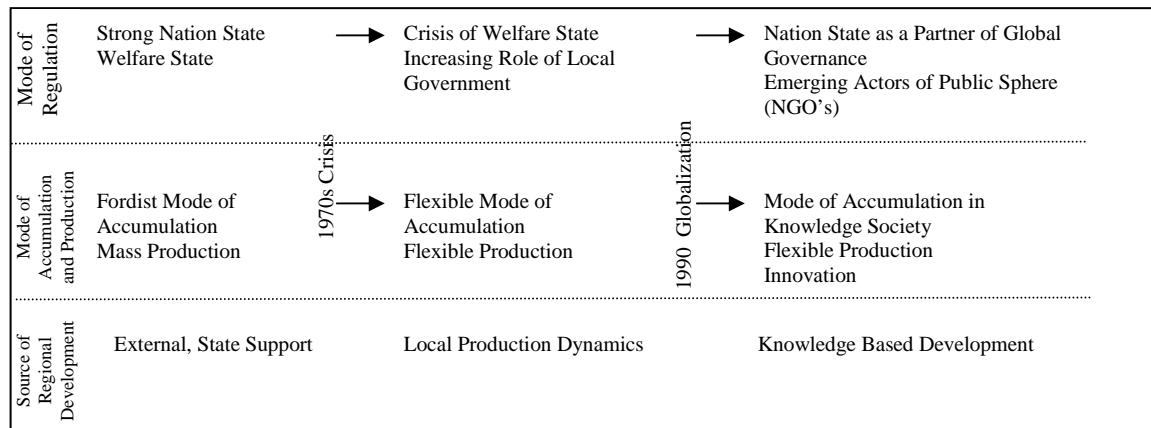


Figure 1 General Characteristics of Three Regional Development Periods

2.1 External State Support

The 1930 crisis and Second World War led to Keynesian welfare state policies, which aimed to bring regulations to the existing capitalist systems, especially the ones related to the redistribution of resources. It offered a planned developmentalist perspective and defined state as the main actor of development. In this period, it was believed that regional

development can be initiated by external support mechanisms, which facilitate the development process by creating infrastructure and leading productive units rather than regional internal dynamics. Therefore, it was argued that local resources can be activated and supported by transfer of resources by the state. Strong nation state and measures for public resource transfers for development were the main characteristics of the first period.

The regional development theories of this period have a high level of abstraction (Eraydin, 2002). They reflect the economic principles and aimed to define basic factors of development, such as external economies and multiplier effects. Regional growth, in this period, was defined as externally driven (external demand, redistributive decision of the state, external decisions of transnational companies). Factors of regional development were outlined as large scale investments, economies of scale, agglomeration economies, externalities and capital accumulation-investment dynamics, vertically integrated economy, and traded interdependencies (Eraydin, 2004).

The dynamics of regional economy were theorized in growth pole theory and economic base theory. Besides, some theoretical efforts were focused on defining regularities of spatial organization and emphasising locational choice problem of production units as well as service enterprises. Economic base theory defines basic sector as the source of development of regional economies that induce multiplier effect on the other sectors and the total economy. According to this theory, selling locally produced goods and services to consumers outside of the region create economic development (Stough and Maggio, 1994). Therefore, it accepts regional growth as a function of increase in export demand. Likewise, growth pole theory argues that economic development strategy should focus investment on a specific sector—that is the growth pole, or sectors, to initiate propulsive development (Stimson, et. al., 2006). In Perroux's (1950) original formulation, a growth pole is referred to as a core that is able to facilitate linkages between firms and industries. In essence, growth in this model is dependent on three sets of processes: large firms, knowledge creation and transfer, and new technology (Plummer and Taylor, 2001). Perroux (1950) also viewed management -by government, large enterprises, or entrepreneurs- as the main driver of regional growth. The growth pole concept has been intensively revised, extended and complemented with other modern economic geographical concepts. The literature was consequently enriched by concepts as industrial complexes, formations, industrial districts and clusters (Harrison, 1992).

2.2 Local Production Dynamics

1970 crisis which caused to eventful changes in economic regimes in the world brought new regional development approach based on local production dynamics. The economic crisis was considered as the end of Fordism and the emergence of the new form of industrial production organization. There have been several attempts to theorize the dynamics of territorial development. As some SMEs and SME clusters were less affected in the crisis, were able to recover in a very short period and began to grow, these efforts were focused on post rationalization of successful SME concentrated areas. Therefore, the theoretical attempts of this period focused on the endogenous nature of growth which became the new nodes of growth in the period of new production organisation system. Flexible production system was

the response to the problems of Fordist type of production and industrial districts and clusters were identified as the means of achieving and maintaining local economic success. Several theoretical debates are introduced that discussed the spatialisation of flexible production.

Flexible-production theory blends elements of regulation theory, institutionalist economics, evolutionary economics, and transaction costs according to Plummer and Taylor (2001). As a model of local economic development, flexibility model is technologically driven and hinges on the local integration of firms through the exchange of goods and information. This integration enables to achieve local external economies of scale and scope and minimizing transaction costs. Flexible production theory also emphasizes trust and reciprocity, the role of small and medium-sized firms on innovation, role of R&D for developing differentiated and localized products.

Industrial district and cluster theories, on the other hand, were formulated around geographical proximity, external economies, agglomeration economies and interaction concepts. Industrial district theory and cluster theory foreground collective pool of knowledge, local skilled labor potential, information exchange facilitated by various forms of social capital, especially the cultural norms of trust, local cooperation and reciprocity, production for the same end market, regional production organizations and locally embedded relations (Eraydin, 2004). Informal links through cooperative and competitive relationships, broad product range and high specialization, low transaction cost, creativity and social and economic reform, creative environments also defined as the assets of industrial districts (Belussi, 1999). Therefore, historical and socio-economic factors become so important to understand new industrial districts (Mouleart and Sekia, 2003).

In these theories regional development was perceived as dependent on internal potentials. Local potential was the core of the regional development literature in the 1970s and 1980s. Elements of development were defined as human capital, local integration of firms, exchange of knowledge and experiences, social capital, trust and reciprocity, geographical proximity, external economies, agglomeration.

2.3 Knowledge Based Economy

While in a highly competitive, borderless environment knowledge economy become more noticeable due to increasing globalisation and production, regional development is redefined in this context. Achieving the capabilities of knowledge based development became the core of theories of regional growth, while the importance of local production dynamics lost their dominance. Knowledge, learning and innovation raised its significance in this period and growth dynamics of regional economy were theorized in innovative milieu, learning regions and regional innovation systems.

Innovative milieu theory offers the space as source of innovation and development. The innovative milieu theory is based on relation between actors and their environment; it interprets spatial characteristics to development as the source of innovative processes and synergies. In innovative milieu theory, innovations and innovative actions are the result of a collective, dynamic process of numerous players in a milieu. The theory also defines the

importance of other factors such as, innovation oriented infrastructure, social homogeneity, governance, identity, network synergy, promoted linkages, knowledge transformation and learning. Therefore, innovative milieu theory underline directly the innovative capacity of the different members of the milieu, which depends on the capacity of learning and thus cultural factors, including social capital, trust and cooperative organization.

Similarly, learning regions are considered as an important debate on regional development in which the main actors (politicians, policy-makers, chambers of commerce, trade unions, higher education institutes, public research establishments and companies) are strongly, but flexibly connected to each other and are open both to intraregional and interregional learning processes. Learning regions build their advantage through creation, dissemination, use and improvement of knowledge which requires knowledge creation institutions and infrastructure (physical, communication and production), intraregional and interregional networks and social capital. They also necessitate skilled human capital to use knowledge, continuous education and training for achieving a high level of skilled human capital.

Moreover, elements of innovative milieu, learning regions and system of innovation were formulated in such a way to define a regional innovation system. Regional innovation system paradigm argues that collective learning and cooperative actions are important to enable regional development. Main factors highlighted by the regional innovation system are innovation and innovation policy; knowledge, learning and training system; interaction between actors (firms, R&D institutions, universities, etc.); employment; labor division; soft infrastructure; universities; small and large firms, entrepreneurs; trust and regional budget.

2.4 Determinants of Growth Defined by Different Regional Development Models

As the brief summary of the theoretical debates on regional development, the determinants of growth/development differentiate substantially in different development discourses. In the first period, regional development was accepted to stem out of external dynamics rather than internal dynamics of the region. External interventions can activate internal potentials and led to development. In this period, investments and incentives of state, large scale infrastructure and manufacturing projects sectoral agglomerations were defined as the major means of development.

Regions with local production dynamics have gained importance in the second period when redistributive role of state decreased due to crisis of the state and deregulatory measures adopted. Local skilled labor, entrepreneurship, local cooperation, R&D, small and medium sized firms, knowledge transformation through interaction of businesses, political decision-makers, institutions and the workforce were underlined in the theories of endogenous growth.

Knowledge economy is much more emphasized in the recent decade Different than the theories centered on intangible factors parallel to growing emphasis on endogenous potentials, contemporary theories see dissemination of knowledge, learning, innovation and innovative environment as the sources of regional development. Table 1 summarizes the components of development defined by the different regional development paradigms.

Table 1 Development Factors by Regional Development Paradigms

Explanatory factors	External State Support	Local Production Dynamics	Knowledge based development
Export	*		
Basic sector	*		
Agglomeration in a specific sector	*		
Linkages between firms and industries	*		
Large firms	*		
State support	*		
Local skilled labor		*	
Entrepreneurship		*	
Local cooperation		*	
R&D		*	
Small and medium sized firms		*	
Knowledge transformation and learning		*	*
Interaction of businesses, political decision-makers, institutions and the workforce		*	*
Social capital		*	*
Capacity of learning			*
Innovation			*
Innovative environment			*
Continuous education			*

* Denotes that the variable is an significant factor in a given theory

3. Regional Development Policies of Turkey

Turkey has prepared plans to stimulate social, economic and cultural development since the beginning of 1960s. National development plans of Turkey gave a special importance to regional inequalities and developed regional development policies compatible with concurrent regional development paradigms. The period between 1960 and 1980 was stated policies period for regional policy. State was the main actor and policy tools were developed in this context.

The 1960s designated a new Constitution and “the planned period”. In fact, it was an attempt to rationalise the growth process and put it into discipline in order to avoid the ups and downs in the economy as it was experienced in the earlier period. The same idea was applied to regional questions. In order to improve the capacities of different regions, which is believed to contribute to the economic development, different regional plans were prepared beginning

from 1958. In the First Five Year Development Plan document “Regional planning” has been described as *“the plan that defines the natural resources and their efficient use, which helps the proper use of land and determines and schedules the public activities that are needed”*. The regional development Projects are prepared for East Marmara, Antalya, Çukurova, Zonguldak and Keban regions during the 1960s. As the distribution of regional development projects showed, most of the planned regions were either relatively prosperous ones or the regions with certain potential for development.

In this period new planning system and institutionalisation of national development planning endorsed several studies on regional differences and the settlement hierarchy. Moreover, as a reaction to the strong emphasis on economic development, the debates on the National Physical Planning attracted very wide attention. The discussions on the National Physical Plans indicated the need to blend national economic objectives with the ones related to the spatial organisation of productive activities and the urban settlement system (Tekeli, 1971; Erder, 1969). Although the discussions related to “spatialization of development plans” took place in the official documents, there happened little efforts to institutionalise this aspect of planning. Instead, a group of experts in the State Planning Organisation were assigned to evaluate the regional issues in planning. The context of the regional policies and regional plans prepared in that period were consistent with the import substitution policy that became the basis of industrialisation in the 1960s. The plans mainly tried to define the industries that can have comparative advantage in the domestic economy and put limited emphasis on export promotion.

Although there was no change in the economic policy, 1970s denoted important changes in regional policies. Firstly, the emphasis on public sector investments was faded in favour of private entrepreneurship. The regional development is seen as *“a cooperative effort of defining natural resources of regions and supporting the most advantageous fields of activity in these areas”*. This new perspective and the lack of administrative capacity and institutionalisation to implement regional plans meant the end of regional planning. Instead, incentive schemes were defined as the major tool for reaching the regional objective of convergence. Even in the plan documents prepared by State Planning Organisation, it was refrained to use the word “region”, whereas several studies conducted in order to determine areas eligible for assistance. The huge rate of inflation, lack of foreign reserves and increasing unemployment during the 1977-80 periods enforced a radical change in the economic and industrialisation model. Import substitution model, which dominated the economic policies for more than twenty years, has been abandoned in favour of export oriented growth. In fact, 1980s became the turning point of economic policies in Turkey, from protectionist attitudes dominated Turkish economic policy prior to this period (Kazgan, 1985, Boratav, 1988) to increasing reliance on market forces.

Under the new economic relations, although encouragement incentives still accepted the main tool of regional policy, Southeast Anatolia Development Plan became the core of attention. In this period, it is also possible to observe increasing attention on “local”, which reflected itself on local administrative system, municipalities and local conditions. Reforms, in the form of delegation of power the local bodies stayed unsatisfactory and limited change in the centralised character of the state was succeeded. While the newly emerging conditions created the new models of regional and local institutionalisation and decision systems in

many countries, these issues stayed untouched in Turkey. The state defined several fiscal rearrangements as parts of export oriented development program. During 1990-93 period new regulations related to floating exchange rate and mobility of capital were brought, which aimed to integrate Turkey to the global economy. However, as seen in many places in the world, this integration deteriorated the capacity of the earlier mechanisms and necessitated new fiscal management policies, which was not taken into account by the governments at that period. As a result, the distortion in the balance of public finance and the wrong policies to deal with increasing interest rates caused the crisis of 1994.

1994 financial crisis had important consequences beyond the economy. It caused the decline in income per capita and led to important degradation in less developed regions, especially in Black Sea Coast and Eastern Anatolia. As expected, the period after 1994 financial crisis has been again devoted stabilisation policies and reforms for recovery. The aim was to change the high rate of inflation conditions and to increase private sector investments especially in productive sectors. The change in the strategy adopted by business enterprises was vital, since during the 1990s instead of investment private enterprise directed most of their savings to treasury bonds, which increased the domestic debt burden of the state. That is why the new economic policies have been mainly directed to create a new economic environment via controlling both the interest rates and the rate of inflation. This situation caused the dominance of short-term needs in the economic policies. Economic problems and decline in income per capita, however, brought the regional discrepancies back into the agenda. Beginning from 1998 the regional plans have been prepared for Eastern Black Sea and Eastern Anatolia Regions. These regions, which fell behind in the development process, have relatively few resources. That is why although there was strong concern to use local potential for development, still the plans followed the traditional approach and gave a strong emphasis on public investment programs. However, there has been increasing awareness that public resources were limited and all infrastructure and productive activities cannot be realised by the public sector. These contradictions stimulated the discussions on “how to define the regional policies to promote growth in regions with limited capacities in the contemporary economic system, where state has limited financial resources and has limited capacity to manoeuvre the global forces”.

The liberalisation of the economy and the deregulation of the financial markets during the 1980s increased the importance of external factors and brought volatility to the economy. Fewer restrictions on the flow of goods provided for a rise in exports, but also increased the amount of imports, which brought negative impacts on the balance of payments. During the 1990s the economy faced several financial crises, which had a negative effect on the financial and production sectors. Different to the earlier economic crises, the crises of 1999 and 2001 meant job losses in specific activities that employed highly skilled personnel, such as banking, as well as financial problems in some production sectors.

In this period it became clear that the pragmatic solutions introduced in the 1980s were not enough to meet the increasing needs of deregulation in the global market. The liberalisation of the economy and integration to the global markets necessitated new administrative reforms, which were mainly imposed by the International Monetary Fund (IMF) and the European Union. In fact, the rules imposed by the EU during the membership negotiations

were mostly related to social and political issues, including governance. During the 1990s, besides important changes in the economic system and deregulation related to trade and finance systems in the previous decade, several important changes were introduced in Turkey in order to comply with the rules of EU and other international institutions, which affected also the existing structure of urban governance (Altaban and Duyguluer, 2004).

In 1999, Turkey has gained candidate status for the European Union in the Helsinki Summit and internal political developments have led to step up efforts for integration with the European Union (Filiztekin, 2008). Besides, 2001 crisis that Turkey experienced pointed out the need of significant policy change. Therefore after 2001 significant changes occurred in regional policy which is developed in cohesion with EU regional policies. In the Eighth Development Plan (2001-2005) and Ninth Development Plan (2007–2013), substantial changes occurred in the regional policies. In the plans, the global economy is taken as a new social reality which involves both opportunities and threats for national development.

Moreover, the agenda imposed by the international institutions enforced the decentralisation of public administration, which has become a key government priority in Turkey since the early 2000s. New laws were adopted to create new mechanisms to transfer major spending powers to Special Provincial Administrations, Metropolitan Municipalities and other Municipalities. Secondly, the new regulations redefined the new roles for metropolitan governments in the provision of services. The new roles assigned to local governments covered education, health and protection of cultural and natural resources, which meant an increased role for the metropolitan municipalities against central government institutions. Third, the new legislation that was adopted in 2005 increased the resources of local governments. Lastly, the Regional Development Agencies are defined as a part of decentralisation of administrative mechanism, although still the dominance of central government is important in decision mechanisms of the agencies established at NUTS II level.

The Turkish experience is important, since it shows the difficulties in formulating regional policies not only in the past but also in the contemporary period, which is increasingly defined by global pressures. It indicates that it was quite hard to follow the consistent regional policies during the development based on import substitution type of industrialisation due to the fluctuations of the economy, although the state has felt an obligation to give assistance to relatively less developed regions. However, the shift from state led development to neo-liberal economic policies at the national level caused a change in classical regional policies to export promotion assistance to regions. The new policy helped the regions with certain capacities and competence and motivated them to use all their accumulated competence in order to gain competitive advantage in international markets, but did not contribute the ones with limited capacities. The policies in the recent decade, although aware of the new conditions defined by the knowledge economy, it is difficult to say that the efforts to develop the innovative basis of the regions are substantial. Most of the regions do not have the capacity to be integrated to the knowledge economy.

In sum, special importance was given to regional development and the elimination of interregional development disparities in national plans. In order to ensure regional development and eliminating interregional disparities, instruments such as regional

development plans investment incentives and Priority Regions for Development policies, organized industrial zone and small industrial estate and rural development projects have been used in Turkey.

4. Hypothesis of the Study

Recent theories highlight technology and innovation, knowledge and learning, cooperation and competition, network and linkages, cultures and trust, social capital and governance. On the other hand, state support which are recognized as tool of early period, are still employed to reduce regional inequalities.

Although substantial amount of development factors have been proposed by theories and models, neither success of theories nor success of these factors is comprehensively discussed yet.

Therefore, hypothesis of this study is defined as state support has still significant contribution to regional development.

5. Empirical Model Design

Various theoretical framework and empirical analyses have emerged in growth arena as discussed. Substantial amount of factors have been proposed by theories and models. Recent theories highlight technology and innovation, knowledge and learning, cooperation and competition, network and linkages, cultures and trust, social capital and governance. It seems recently that there is consensus on factors of regional development, neither success of theories nor success of these factors is not comprehensively discussed yet.

Therefore, an empirical study was designed to test regional development paradigms/ theories. This test also enables us to identify and explain the relationship between factors and development.

After defining factors for each theory, factors eliminated and factors make sense and specific to the theory are kept. Sets of measurable variables and proxies are developed for each model to try to encapsulate the processes they recognize as driving growth.

Defining and choosing proxies that (best) express intangible factors and limits of available or attainable data are two main constraint of the study. Within this condition, proxies are developed to measure the variables drawn from the review of theories. 18 proxies are developed in preliminary analysis of three regional growth paradigms.

In order to select proxies that reflects factor ideally, factors and indicators identified in empirical studies defined and annual data availability for relevant NUTS 3 regions and for the period of 1980-2010 was checked. Practical limitations on consistent data availability are the main decisive in selection of factors. As there is no time series data for selected factors, study is done for 2005-2008 period.

In order to control unobserved heterogeneity, data for proxies are collected to get panel data rather than cross-sectional data. The period of coverage is from 2005-2008. Collected data is standardized by using variables (i.e. population, employment and area) depending on the nature of proxy.



Figure 2 NUTS 3 Regions of Turkey

It was aimed to use general-to-specific modelling strategy to evaluate the models of local economic growth, but overlapping period of available data is very limited to form a general (over parameterized model). Therefore general-to-specific modelling method is not used. For each theory, static model is established for panel data and tested. Empirical model design and analysis has been conducted using Oxmetrix 6.01. The factors and proxies are listed in Table 2.

Table 2 Highlighted Factors by Theories and Proxies Used

Factors	Proxies
Growth	GDP per capita growth
Export	Export per capita
Basic sector	Share of employment in agriculture, industry and service sectors*
Agglomeration in a specific sector	Share of sectors in GDP*
Large firms	Share of firms in top 100 highest tax to population
Public investment	Public investments per capita
State support	Existence of regional development plan
State support	Development priority provinces
Incentives	Per capita incentives to private sector investments
Local skilled labor	Share of vocational graduate*
Entrepreneurs	Number of established trade companies per 10 000 persons
Local cooperation	Number of established companies and cooperatives per 10 000 persons
R&D	Academicians per person
Small and medium sized firms	Number of SMEs receiving investment and operation credits
Innovation	Number of registered patent
Knowledge transformation and learning	Number of thesis per person
Capacity of learning	Student teacher ratio
Innovative environment	Number of technology development zone
Social capital	Number of established foundations per person
Continuous education	
External economies arise from existence of shared infrastructure, services, information	Number of OIZ Plot

* Interpolated using available data.

GDP per capita growth is used as dependent variable. As GDP data at NUTS 3 level is available until 2001, for 2005-2008 the data is only available for NUTS 2 level GDP values are distributed to NUTS 3 level using electricity consumptions.

6. Main Characteristics of Variables Used in the Econometric Analysis

GDP and GDP per capita values are the basic indicators reflecting the economic development. Although GDP per capita at Turkey performed significant growth, GDP per

capita is very low comparing with EU and OECD countries. GDP per capita in purchasing power standards of Turkey is about 48 % of EU-27 (EU, 2011). Similarly GDP per capita in purchasing power parity of Turkey is approximately 41 % of OECD countries (OECD, 2011).

Analysing GDP per capita at NUTS 3 level for the period of 2005-2008 shows that, increase in GDP and so GDP per capita at Turkey scale is also valid at NUTS 3 scale. Geographical representation of GDP per capita pattern at NUTS 3 regions shows gradually decreasing pattern from west to east in Turkey. Figure 3 shows 2008 GDP per capita by NUTS 3 regions.



Figure 3 GDP Per Capita by NUTS 3 Regions, 2008

Average annual GDP per capita growth rate (2005-2008) by NUTS 3 regions is illustrated in Figure 4.



Figure 4 GDP per capita Growth by NUTS 3 Regions, 2005-2008

In Turkey, public investment, particularly public infrastructure and social investment, is recognized as the most important determinant of capital accumulation, therefore development.

A historical exploration in Turkey public investment, one of the turning points is observed in the early 1980s. During this period, with the start of the transition from inward-looking import substitution to export-oriented and outward-looking structure, structure of public investment policies and priority sectors in public investments have begun to change. In general, the rule is left to national or global private equity actors. Private sector aiming financial profitability directed to investments brings high levels of return. Public sector aimed social profitability and began to intensify areas that are seen unprofitable by private sector, particularly infrastructure investment.



Figure 5 Total Public Investment per Capita by NUTS 3 Regions, 2005-2008

Figure 5 illustrate total public investment per capita by NUTS 3 regions. Ongoing or completed large cost public projects are very important in the distribution of investment to NUTS 3 regions.

Patents, as indicators of innovation plays significant role in economic performance and thus development. Patents per person significantly have increased in 2005-2008 period. This development pattern can be explained by implementation of patent laws, policies and incentives aiming to encourage technological developments increase in the number of universities and share of university graduates.

Even though the increase in registered patent increased in the recent decade, Turkey's registered patent is still very low compared to EU and OECD averages. This situation can be explained by low innovation performance, low investment on science and technology and modest R&D expenditures.

Historical development pattern of patent numbers at national level is also valid at NUTS 3 level but still there are NUTS 3 regions which have no registered patent yet. Geographical

distribution (Figure 6) shows that patents are concentrated on industrialized areas, lowest patent per capita ratio belongs to East and South East Anatolian NUTS 3 regions.

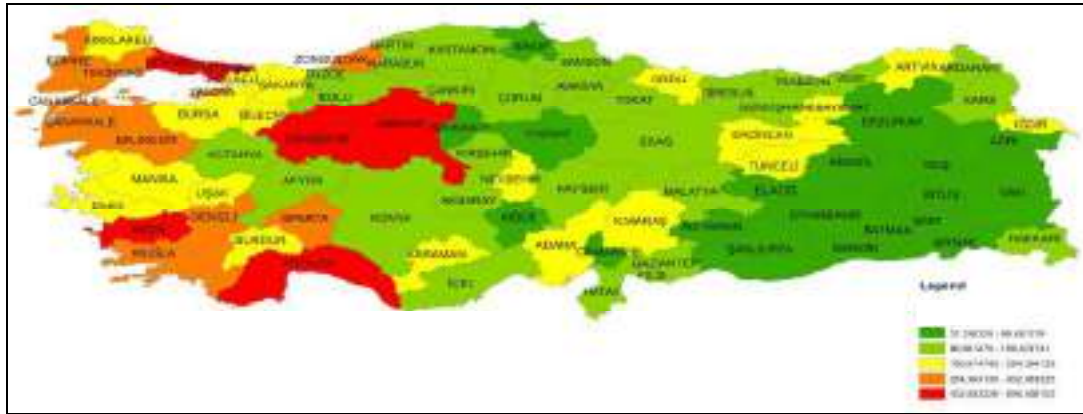


Figure 6 Total Registered Patent per Million Inhabitants by NUTS 3 Regions, 2005-2008

Number of established trade companies and cooperatives is the reflection of entrepreneurship capacity. Number of established trade companies at national scale is increased in the analyzed period, but after 2006, growth ratio started to decrease sharply.

Number of established trade companies per inhabitant shows more homogenous distribution on geography but south east Anatolia regions owns lowest values (Figure 7).



Figure 7 Established Trade Companies per 10 000 Inhabitant by NUTS 3 Regions, 2010

7. Model Results

From the GDP growth relativities for 2005-2008, the general model specification is as shown in Table 3. In the general model specification, the set of explanatory variables accounts for 32,6 % of the variability in GDP growth relativities between regions the period of analysis.

Table 3 General Model Specifications

	Coefficient	Std.Error	t-value	t-prob
Export	-2.99966e-005	0,0009	-0,0325	0,9740
Share of employment in agriculture sector	13,1705	5,7810	2,2800	0,0240
Share of employment in industry sector	12,8216	5,7670	2,2200	0,0270
Share of employment in service sector	13,2870	5,8330	2,2800	0,0240
Share of services in GDP	0,6556	0,1274	5,1400	0,0000
Share of industry in GDP	0,5488	0,0925	5,9300	0,0000
Share of agriculture in GDP	0,4098	0,1080	3,8000	0,0000
Number of large firms	0,1784	1,4900	0,1200	0,9050
Total public expenditure	-0,0004	0,0023	-0,1740	0,8620
Regional plan	-1,4062	2,3880	-0,5890	0,5560
Priority regions in development	-2,1452	2,3780	-0,9020	0,3680
Total incentives investment	0,0010	0,0012	0,9040	0,3670
Share of vocational school graduate	1,4597	1,1970	1,2200	0,2240
Number of established trade companies	0,0454	0,0271	1,6800	0,0950
Number of established companies and cooperatives	-0,1229	0,0677	-1,8200	0,0700
Academicians per person	-0,0251	0,0483	-0,5200	0,6030
Number of SMEs receiving investment and operation credits	0,7082	0,0936	7,5700	0,0000
Number of registered patent	0,1374	0,3037	0,4520	0,6510
Number of thesis	0,0105	0,0062	1,6800	0,0940
Total student teacher ratio	1,4045	0,3417	4,1100	0,0000
Number of technology development zones	-2,9678	2,2610	-1,3100	0,1900
Number of established foundation	0,0147	0,0621	0,2360	0,8140
Plot of OIZ	0,0003	0,0004	0,6000	0,5490
Constant	-1358,3200	580,2000	-2,3400	0,0200

R² 0.3264279

no. of observations 292, no. of parameters 24

From the set of regionally specific structural variables eleven of them are statistically significant. Share of employment in three main sectors, share of three main sectors in GDP and number of trade companies, number of companies and cooperatives, number of SMEs, number of thesis and student teacher ratio are significant to explain GDP growth rates.

Those regions with higher capacity of learning as measured by student teacher ratio have higher estimated GDP growth relativities. Similarly, those regions with a better, knowledge transformation and learning as measured by number of thesis are predicted to have higher GDP growth rates. Besides, those regions with a better entrepreneurship tradition, as measured by number of established trade companies are predicted to have higher GDP growth rates. More controversially, those regions with higher local cooperation, as measured by the established companies and cooperatives, are predicted to have lower GDP growth rates.

Thus, while capacity of learning, knowledge transformation and learning, small and medium sized firms and entrepreneurship generate GDP growth in the Turkey context, levels of local cooperation is counterproductive.

The remaining variables are not individually significant. It is surprising that the variable intended to capture external state support; public expenditures and incentives to private sector investments and other regional development policy tools –priority regions in development, regional plan are not statistically significant and do not explain GDP growth in the general model. This is not consistent with our theoretical expectations. Similarly, number of large firms and export do not explain GDP growth in the general model.

Besides, local skilled labor as measured by share of vocational graduate, R&D as measured by number of academicians, innovation as measured by number of registered patent, innovative environment (as measured by number of technology development zone, social capital as measured by number of established foundations and external economies arise from existence of shared infrastructure, services, information measured by number of organized industrial zone plot are statistically significant.

Similar to the general model, in the external state support model only share of three main sectors in GDP which are representing agglomeration seems to be significant in terms of explaining the GDP growth. Other factors highlighted by the early paradigm and theories are not statistically significant (Table 4).

Although state support was emphasized in the first paradigm, state support and incentives have been seen as significant policy tool in many countries since first paradigm. European Union and Turkey employ this tool. State support represented by total public expenditure, regional plan, priority regions in development and total incentives investment have no effect on GDP growth according to model results, which is quite interesting.

From the set of variables representing local production dynamics only two of them are statistically significant. Number of SMEs as measured by number of SMEs receiving investment and operation credits and knowledge transformation and learning as measured by number of thesis explain GDP growth rates.

Table 4 External State Support Model Specifications

	Coefficient	Std.Error	t-value	t-prob
Export	0,0003	0,0008	0,3580	0,7200
Share of employment in agriculture sector	2,7918	5,7500	0,4860	0,6280
Share of employment in industry sector	2,5681	5,7630	0,4460	0,6560
Share of employment in service sector	2,8526	5,7850	0,4930	0,6220
Share of services in GDP	0,6288	0,1350	4,6600	0,0000
Share of industry in GDP	0,5582	0,1071	5,2100	0,0000
Share of agriculture in GDP	0,4897	0,1189	4,1200	0,0000
Number of large firms	-0,5014	1,1220	-0,4470	0,6550
Total public expenditure	-0,0017	0,0026	-0,6570	0,5120
Regional plan	1,0588	2,5700	0,4120	0,6810
Priority regions in development	-1,7909	2,6650	-0,6720	0,5020
Total incentives investment	0,0018	0,0015	1,1400	0,2550
Constant	-290,3100	577,0000	-0,5030	0,6150

R² 0.08726124

no. of observations 292 no. of parameters 13

Those regions with higher number of SMEs have higher estimated GDP growth relativities. Similarly, those regions with a better knowledge transformation and learning are predicted to have higher GDP growth rates.

Table 5 Local Production Dynamics Model Specifications

	Coefficient	Std.Error	t-value	t-prob
Share of vocational school graduate	0,1447	0,9959	0,1450	0,8850
Number of established trade companies	-0,0108	0,0325	-0,3330	0,7400
Number of established companies and cooperatives	-0,0550	0,0504	-1,0900	0,2760
Academicians per person	-0,0827	0,0516	-1,6000	0,1100
Number of SMEs receiving investment and operation credits	0,7164	0,1005	7,1300	0,0000
Number of thesis	0,0143	0,0062	2,2900	0,0230
Number of established foundation	-0,0357	0,0462	-0,7740	0,4400
Constant	30,8007	4,6870	6,5700	0,0000

R² 0.1666479

no. of observations 292 no. of parameters 8

It is quite interesting that local skilled labor, entrepreneurship, local cooperation and R&D that are highly stressed by second paradigm are statistically insignificant according to the model result.

Three of knowledge based development variables are statistically significant. Knowledge transformation and learning as measured by number of thesis, capacity of learning as measured by student teacher ratio and innovative environment measure by number of technology development zone explain GDP growth rates.

Those regions with higher capacity of knowledge transformation and learning, and innovative environment have higher GDP growth.

On the other hand social capital measured by number of established foundations per person and innovation measured by number of registered patent which are core of last regional development paradigm are not statistically significant.

Table 6 Knowledge Based Development Model Specifications

	Coefficient	Std.Error	t-value	t-prob
Number of thesis	0.0124520	0.005588	2,23	0,027
Number of established foundation	0,0578082	0,03926	1,47	0,142
Total student teacher ratio	1,04768	0,3009	3,48	0,001
Number of technology development zones	-3,70836	1,64	-2,26	0,024
Number of registered patent	0,503669	0,3453	1,46	0,146
Constant	11,7509	5,459	2,15	0,032

R² 0.06756094

no. of observations 324 no. of parameters 6

8. Conclusion

We have attempted in this paper to test empirically different theoretical frameworks of regional growth for explanatory power of regional growth in Turkey. The transformation in the regional development paradigm can be observed in Turkey’s regional development policies and practices. Therefore, it was intended to test for 1980-2010 period, but available data limited the study for the period 2005-2008.

Like many countries, available data to be used as proxies for the factors is insufficient in Turkey. Therefore much of the proxies are general. On the other hand, available time period of collected data is another barrier for such study. For example GDP data at NUTS 3 level is available until 2001. GDP data at NUTS 3 level is calculated by using GDP data at NUTS 2 level by using electricity consumptions. Although this issue is the weakness of the study, the

result of the study seems to be significant to discuss explanatory power of theoretical frameworks of regional growth.

Eighteen broad dimensions representing the hypothesized drivers of regional growth have been derived from the paradigms and theoretical models. A general model was developed within which the dimensions derived for the competing theoretical paradigms/ models were nested. The results of the empirical modeling process are conspicuous. While there are significant contributions of factors of local production dynamics and knowledge based economy in the general model, contributions of elements highlighted by state supported development is much more limited.

Agglomeration in a specific sector, number of small and medium sized firms, knowledge transformation and learning and capacity of learning are the factors that are statistically significant at least two models.

Table 7 Significant Variables by Models

Explanatory factors	General Model	External State Support	Local Production Dynamics	Knowledge based development
Export				
Basic sector				
Agglomeration in a specific sector	*	*		
Linkages between firms and industries				
Large firms				
State support				
Local skilled labor				
Entrepreneurship	*			
Local cooperation	*			
R&D				
Small and medium sized firms	*		*	
Knowledge transformation and learning	*		*	*
Interaction of businesses, political decision-makers, institutions and the workforce				
Social capital				
Capacity of learning	*			*
Innovation				
Innovative environment				*
Continuous education				

* Denotes that the variable is statistically significant in a given model

The study shows that while public expenditures and incentives to private sectors that are central to state supported development surprisingly do not have impact on regional growth in Turkey, local production dynamics and knowledge based economy models offer partial explanations of regional growth. Hence, there is no paradigm fully explaining regional growth.

9. References

- Belussi, F. (1999) "Policies for the Development of Knowledge-Intensive Local Production Systems", Cambridge Journal of Economics, Oxford University Press, vol. 23(6), pp: 729-747.
- Elmas, G. (2004), "Cumhuriyetin İlanından Günümüze Türkiye’de Bölgesel Politikalar", Ekonomik Yaklaşım, 2004:15 (50), pp. 115-136.
- Eraydın A. (2004). "Bölgesel Kalkınma Kavram, Kuram Ve Politikalarında. Yaşanan Değişimler", Kentsel Ekonomik Araştırmalar Sempozyumu, DPT, PAÜ
- Eraydın, A. (2002) Yeni Sanayi Odakları: Yerel Kalkınmanın Yeniden Kavramlaştırılması, METU, Faculty of Architecture Press, Ankara.
- EU (2011) <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsieb010>
- Filiztekin, A. (2008) Türkiye’de Bölgesel Farklar ve Politikalar, TÜSİAD, İstanbul,
- Harrison, B.(1992) "Industrial Districts: Old Wine in New Bottles?", Regional Studies, 26(5), pp.469-483.
- Moulaert, F. and Sekia, F. (2003) 'Territorial Innovation Models: A Critical Survey', Regional Studies, 37: 3, 289 - 302
- OECD (2011) <http://www.oecd-ilibrary.org/docser/wload/fulltext/3010061ec009.pdf?expires=1322352591&id=id&accname=freeContent&checksum=D1ED6F33925C9EE2A439AA4195E509AC>
- Plummer, P. and Taylor, M. (2001) "Theories of Local Economic Growth (part 1): Concepts Models and Measurements", Environment and Planning A, 33, p.219-236.
- Stimson, R. J., Stough, R. R. and Roberts, B. H. (2006) Regional Economic Development Analysis and Planning Strategy, Springer-Verlag Berlin Heidelberg.



- Stough, R. R. and Maggio, M. E. (1994) Evaluating IVHS/ITS transportation infrastructure in a metropolitan area. In: Proceedings of the Korea-USA Symposium on IVHS and GIS-T.U.S. and Korean National Science Foundations, Seoul, Korea
- Tekeli İ. and Pınarcıoğlu M. (2004) Commitment model for regional planning: How to unlock frozen gears of stagnant regions. In: T. Gök and T. Marszai, Editors, Urban and regional development: Concepts and experiences, Academy of Sciences, Warszawa, pp. 9–28.