

Hacer Simay Karaalp<sup>1</sup>

**THE EFFECT OF PUBLIC INVESTMENT AND FIRM-BASED INVESTMENT INCENTIVES ON  
EMPLOYMENT:  
A PANEL DATA ANALYSIS FOR TURKEY**

***Abstract***

This paper investigates the effects of two public policies, public investments and the firm-based investment incentives within the context of Law No. 5084, which considers the support of employers' social security premium payments on the private sector employment at the NUTS 3 regional level (81 provinces) of Turkey for the period of 2002-2011. To the best of the author's knowledge, there appears to be no empirical study that deals with the effectiveness of both public investment and the investment incentive within the context of Law No. 5084 on employment at the regional level. The results indicate that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. However, during the interpretation of the analysis one should also take into account the faults of the implementation. On the other hand, public investment for infrastructure and education also affected employment positively.

***Keywords***

Employment, Firm-based investment, Public investment

**1. Introduction**

Although the effectiveness and the success of the public policies on private sector performance have been discussed since the earlier regional development policies, they still preserve their prominence in the development process of countries, especially to stimulate economic activities in the lagged regions and thus to attract investment, government support for firms' production and investment costs by applying public policies. Therefore, firms' competitiveness and the scale of new investments will increase and new employment opportunities will be revealed.

Turkey, which is an emerging economy, has been struggling with regional and local economic development problems like many other developed and developing countries. One of the main problems in Turkey is the unbalanced economic development between eastern and western regions of the country. Since the inception of the Turkish Republic and with the initiation of the planned period since the 1960s, different regional development policies have been implemented in order to induce investment, to create jobs and to increase growth in low income regions to equalise interregional per capita income. While, in the period of etatism, the main attempts were towards the redistribution of public services and

---

<sup>1</sup> Pamukkale University, Faculty of Economics and Administrative Science, Turkey, e-mail: skaraalp@pau.edu.tr

industrial investment to different parts of the country in order to develop a national economy, since the planned period regional development policies have focused on the growth centres. After the 1980s, following the rise of endogenous development theories in regional economy, the incentives for enhancing local potentials in priority regions for development (PRD) was applied in the regional policy of Turkey ([http://research.sabanciuniv.edu/8875/1/MILESTONES\\_OF\\_REGIONAL\\_POLICY\\_IN\\_TURKEY.doc](http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc)). In the 1990's, in parallel with the rise of the new regionalism approach, the effect of active regional policies in general and the necessity of public intervention gained importance (Karaçay-Çakmak and Erden, 2004; Pirili, 2011). In this context, during the last decades of the 20th century, Turkey's attempts to adopt the regional policy criteria of the EU in order to harmonise its legislation and the effect of public policies in regional economic development also became important in Turkey. Within this framework, Law No. 5084 enacted in 2004 comprises of the incentive for regional investment and employment as the most comprehensive and the most recent regulation for 49 provinces.

Investigating the impact of public policies, in this context public investment and incentives, together or separately on output and employment has been an issue for limited empirical studies dealing with the national and regional levels of Turkey in recent years (see Kaynar, 2001; Karaçay-Çakmak and Erden, 2004; Ay, 2005; Erden and Karaçay-Çakmak, 2005; Akan and Arslan, 2008; Özkök, 2009; Eser, 2011; Yavan, 2011). The results of these studies generally point to the positive effects of investment incentives on output and employment. However, some studies found no clear evidence of the positive effect of investment incentives (see for instance Karaçay-Çakmak and Erden, 2004; Erden and Karaçay-Çakmak, 2005; Eser, 2011). Eser (2011) concluded that, although the effect of investment incentives with Law No. 5084 increased employment in the less developed regions, due to problems arising from the structure of investment incentives they were sometimes inefficient in directing the investments in terms of regions and sectors. On the other hand, most of the limited number of empirical studies analysed the impact of public investments on income with the national and regional levels (see Karadağ, Önder and Deliktaş, 2004; Yıldırım, 2005; Deliktaş, Önder and Karadağ, 2009; Önder, Deliktaş and Karadağ, 2010). According to the findings of these studies, public investment is an effective policy tool for increasing regional income and reducing regional disparities.

Therefore, the main aim of this paper is to analyse the effects of two public policies, public investments and the firm-based investment incentives within the context of Law No. 5084, which considers the support of employers' social security premium payments on the private sector employment at the NUTS 3 regional level (81 provinces) of Turkey for the period of 2002-2011. To the best of the author's knowledge, there appears to be no empirical study that deals with the effectiveness of both public investment and the investment incentive within the context of Law No. 5084 on employment at the regional level. In this respect, the present study is the first attempt to investigate the effects of both public investments and the incentive investment on employment by using panel data analysis.

The remainder of this paper is organised as follows. Section 2 provides basic information about the regional development theories. Section 3 gives brief information about public investments and the investment incentives in the regional development of Turkey. The methodology and the data set employed in the study are presented in Section 4. The panel

data estimation results are given in Section 5. The paper concludes with a summary analysis of the findings in Section 6.

## **2. The regional development policies**

The regional disparity which is the economic and social opportunity gap among regions has been one of the most important issues in terms of economic and regional development in all countries since the industrial revolution. During the development efforts of countries, while some regions stand out among others and attract capital, investment and population, some regions lag behind. Since regional disparities threatened the economic development of countries, finding a solution became necessary for all countries. First of all, there was an attempt to explain regional disparities in terms of economic, historical, geographical, social and cultural factors. However, due to insufficient explanation of these factors, the need for new approaches emerged.

The method of solving regional disparities differs according to the dominant economic approach in the world economy. Although many differences, controversies, conflicts and renewable theories could be observed from the 1930's to the mid-1970's, the common aim of all approaches was to emphasise the necessity of implementation of active public intervention to eliminate income inequalities and to boost economic and regional development. During this period, due to the hegemony of Keynesian economics, the widespread solution of inequalities was based on government intervention and planned development (Karaçay-Çakmak and Erden, 2004; Kadioğlu, 2007; Pirili, 2011).

However, at the end of the 1970's, traditional regional development approaches started to lose their hegemony. This was due to Keynesian economics having failed to find solutions for consecutive economic crises, and the globalisation trends which emerged with the rapid improvement of technology, which also affected regional development aspects. Secondly, the unsuccessful results of the traditional regional development policies for reducing the income gap between developed and developing countries and the regions in the 1950's and 60's weakened the fundamental basis of active and planned regional policies. Moreover, countries could not afford to finance regional planning policies due to economic crises. Therefore, the Keynesian approach, government intervention in economic development and thus the implementation of public investments and incentives were abandoned, and the Neo-Classical economic policies which advocated the shrinking of government in every field of the economy were revived. In this context, the subjects of economic stabilisation, deregulation, privatisation and economic efficiency started to be discussed. However, although the intensive use of regional planning, public investments and investment incentives decreased, they continued to be used (Karaçay-Çakmak and Erden, 2004; Pirili, 2011). At the end of the 1970's, with the effect of the Neo-Classical paradigm and globalisation, a new regional development approach started to arise. Instead of a government controlled development model, the new model - called 'endogenous regional development' - was based on regional or local entrepreneurship and self-developed mechanisms.

However, since the 1990's, the importance of regional development differences and the implementation of active regional policies in general and the necessity of public intervention have revived again. Following these developments, the reasons of emerging new aspect - called 'new regionalism' - can be classified as follows: especially since the mid-1990's, the local unit-based approach to regional or local entrepreneurship was not effective in less developed countries and regions due to limited resources and inadequate opportunities. The new regionalism and the new role of the government were also evaluated in the EU's regional development policies. Throughout the enlargement process of the EU, with the integration of less developed countries and regions, the significant income gap between regions started to threaten the economic and social integration of the EU. For this reason, and to reduce income disparities, the implementation of regional development policies and thus the need for public policies became important (Buton, 1998; Pirili, 2011). Under the framework of EU regional development policies, the EU adopted the obligation of using public funds to boost economic activities for private investment and entrepreneurship in less developed regions parallel with a new regionalism approach (Karaçay-Çakmak and Erden, 2004). Therefore, in the 1990's a new regional development approach was formed with the contribution of the 'new economic geography', which adopted the theoretical and technical propositions of the endogenous growth model to the spatial and regional level (Krugman, 1991a; Krugman, 1991b; Porter, 1990) and the Neo-Shumpeterian approach (see also Pirili, 2011).

Within this framework, the regions with efficient infrastructure and human capital and sufficient institutions contributing technological improvement and innovation would develop and grow more than other regions. Therefore, the importance of the government's contribution or the effect of public policies in regional economic development became important. In this context, this study focuses on the effectiveness of two significant public policy tools, public investments and investment incentives, in the economic development of regions and, therefore, in employment.

Public investments are one of the most preferred tools for governments to reduce disparities between regions and to boost economic development (Sturm, Jacobs and Groote, 1999). Public investments are composed of various types of physical investment, such as transportation, energy, water and social investments (human capital investments) such as health, education and services. In this context, the types and the geographic distribution of public investment projects are two of the most controversial issues in regional development.

Due to less developed regions lagging behind, they cannot boost economic activities by themselves with their limited resources. The main characteristic of the less developed regions is the low income level because of the lack of employment-creating economic activities. In this case, to improve the environment for entrepreneurship and to attract new investment into less developed regions, the government should apply some facilities and advantages to the entrepreneurs that prefer to invest in these regions. Therefore, public investments support the physical and social development of the regions and increase the attractiveness of the regions for investment. As a result, a region with adequate infrastructure, low cost energy and effective human capital will attract investments, increase economic activities and therefore create employment. Another significant tool used to reduce disparities among regions is investment incentives.

Investment incentives are another important regional development tool that has been used in many countries. As a public policy, investment incentives play a crucial role in boosting the economic activities in the less developed regions, as well as public investment. Incentive is the financial or non-financial support, aid or encouragement that is applied by the government with the aim of providing more and faster development of specific economic activities. One of the objectives of investment incentive policies is to implement specific incentive policies with a view to speeding up the development of economically and socially underdeveloped regions (Özaslan, Dinçer and Özgür, 2006). Incentives can be stated as grants in aid, subsidies, transfer expenditures to producers, premiums and supports (Kadioğlu, 2007). Without contradicting international obligations and in accordance with the foreseen targets of the development plans and annual programmes, incentive is the support and the lead of investments to eliminate regional disparities, to create employment, to use advanced, suitable and high value added technologies and to provide international competitiveness. The efficiency of incentive tools and the incentive implementations that are used to eliminate regional disparities can differ according to the development programmes and the economic and social characteristics of countries (Ildirar, 2004).

Incentives (classical incentives) can be classified according to three groups: financial incentives, tax incentives and indirect financial incentives. Financial incentives are grants, loans and loan guarantees and insurance provided by the government. The aim of the implementation of tax incentives is to increase investments and employment in less developed regions, and to support specific sectors and economic activities. The principal and most common tax incentives are tax holidays, accelerated depreciation implementation, investment allowances and tax credits, income and corporate tax reductions, indirect tax exemptions and free zones. In this context, by using these incentives, the plant location choice of entrepreneurs tries to be conducted to less developed regions. By providing these facilities, less developed regions try to become advantageous for starting a new business or decreasing production costs. Indirect financial incentives can be classified as regulatory incentives to improve environment, health, labour and safety standards, and to give education-based incentives for entrepreneurs regarding the infrastructure and pre-investment technical issues, giving priority to public procurement in some sectors or types of investment, protection against imports, and supporting investments that increase exports. In recent years, incentives have been used not only for investment, employment and exports but also to promote R&D and innovation in firms. Through the gaining importance of the development of the small- and medium-sized enterprises (SMEs) and the increase of competition with the support of new initiatives, the components of the incentives expanded to the 'new generation incentives', such as providing information and consultancy activities for SMEs, incubator centres, employment training, supporting R&D centres (Eser, 2011).

Both in the developed and developing countries the ultimate aim of public policies is economic development. In the developed countries, the public policies such as public investments and incentives are applied to develop the lagging regions, to decrease unemployment, to sustain technological improvement and to increase productivity in certain activities. But in the developing countries the importance and the need for public policies increases due to common economic problems such as high inflation, unemployment, high interest rates, increasing debt burden and inequality in income distribution (Özkök, 2009). In

the developing countries, public policies play a crucial role in reducing regional disparities, in creating employment, in stimulating the production of value added products, industrialisation, increasing international competitiveness and, therefore, the economic development of the country.

### 3. Regional development policies in Turkey

Turkey is composed of different regions with different economic, social and cultural characteristics. Thus, reducing the regional disparities between the regions of Turkey has been an important issue in terms of regional economic policies since the foundation of the Republic of Turkey. In this context, the regional development policies can be evaluated between two separate periods, before and after the 1990's (see also Eser, 2011).

The special importance and the aim of reducing development differences among regions has been attributed to the planned era. The elimination of the imbalance between regions has been one of the priority areas in all development plans devised (Özaslan, Dinçer and Özgür, 2006). From the first development plan (applied between 1963 and 1967) to 1999, development plans have been based on national development rather than regional development. Regional development was considered within the narrow scope of public development planning and evaluated within the framework of an integrated approach including physical, social and economic dimensions. With the initiation of the planned period since the 1960s, regional policy has been mainly shaped by development efforts focused on growth centres. Especially after the 1980's, following the rise of endogenous development theories in regional economy, the incentives for enhancing local potentials in PRD and supporting local entrepreneurship and local actors have assumed an important place in the regional policy of Turkey ([http://research.sabanciuniv.edu/8875/1/MILESTONES\\_OF\\_REGIONAL\\_POLICY\\_IN\\_TURKEY.doc](http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc)). Priority has been given to underdeveloped territories in the distribution of public investments in all plans and programmes. Through PRD policies the priority was given to the less developed east and south-east Anatolia regions and Black Sea regions. However, except the South-eastern Anatolia Project (SEAP), one the most important of these plans, other integrated regional development policies, could not achieve a considerable success. These precautions were not sufficient to eliminate regional differences, migration, and rapid population increase in large cities. The late 1990s and early 2000s, significant developments experienced for regional development incentives. Since the 1990's, Turkey has tried to develop its regional policy in compliance with EU regional policy, introducing structural reforms for reducing regional disparities in the country ([http://research.sabanciuniv.edu/8875/1/MILESTONES\\_OF\\_REGIONAL\\_POLICY\\_IN\\_TURKEY.doc](http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc)). Between these years, direct policies (such as to provide credit facilities) applied to the regions to continue the uncompleted investments in the less developed regions (with Law No. 96/8905 dated 07.11.1996) and with Law No. 4325 dated 23.01.1998 the PRD was identified and incentive policies were introduced for these areas. Also, with Law No. 99/12478 dated 26.02.1999, electrical energy support was provided for investments located in the less developed regions.



### 3.1. Law No. 5084

In recent years, to reduce regional disparities, incentive policies have become prominent. To speed up the investments and employment and to increase the contribution of the private sector to the regional development, new incentive policies started to be used in 2004. Law No. 5084, enacted in 2004, which comprises incentives for regional investment and employment, is the most comprehensive and the most recent regulation in Turkey (Eser, 2011). The aim of the law is to increase investment and employment in the less developed provinces by implementing tax and insurance premium incentives, giving energy support and providing free investment place allocation. Law No. 5084 comprises 49 provinces.

In the first version of Law No. 5084 in 2004, 36 provinces were selected according to the following criteria: The per capita GDP level was lower than 1,500US\$ in 2001 and provinces were evaluated in the PDAs. The private firms located in these provinces could benefit from the income tax being withheld from the wages of new personnel, treasury's contribution to the employers' social insurance payments, energy support and the investment place free of charge. In 2005, with Law No. 5350, 13 provinces whose social economic development index as determined by the State Planning Organisation (SPO) was found to be negative in 2003, were included in the scope of the classification. Moreover, with Law No. 5615, the Gökçeada and Bozcaada districts of Çanakkale were included within the scope of the incentives (<http://ekutup.dpt.gov.tr/plan/plan9.pdf>).

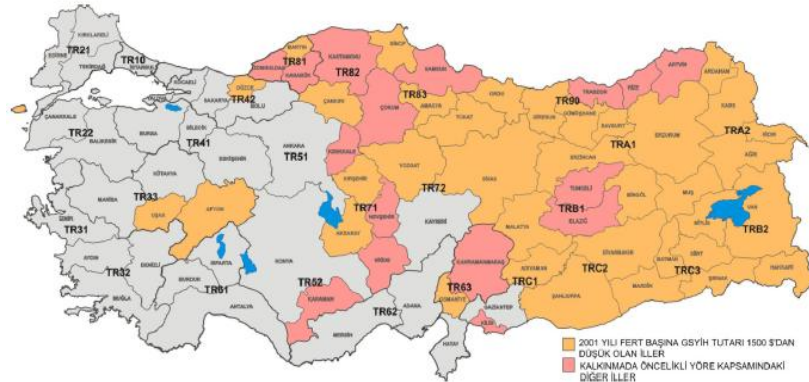


Figure 1: Provinces under the Law no 5084 (Eser, 2011)

According to Figure 1, except for Gaziantep, nearly all the provinces in east and south-east Anatolia were included in the scope of Law No. 5084. In the western part of Anatolia only Kütahya, Uşak, Afyon and Düzce and the Bozcaada ve Gökçeada districts of Çanakkale were included. In Figure 1, the significant development differences can be observed between the eastern and western parts of Turkey, therefore the aim of Law No. 5084 was to eliminate this disparity.

To this end, the incentives applied within the framework of Law No. 5084 comprise an income tax withholding incentive, employer's contributions in insurance premium incentive, free investment place allocation and energy support (<http://www.gib.gov.tr/index.php?id=820>). The investment incentive Law No. 5084 which is analysed in this study comprises social insurance payment of employers' contributions by

the treasury. According to the law, on the condition that firms locate in the determined provinces and provide all requirements, the treasury will contribute the total share of employers' social security premium payments if the private firms' located in the organised industrial zones, otherwise the treasury will contribute the 80% of the share of employers' social security premium payments if firms locate in other places. However, to cope with the latest financial crisis in 2008, the implementation of Law No. 5084 extended until 31.12.2012 for all incentives except energy support ([http://uye.yaklasim.com/filezone/yaklasim/tummevzuat/sgk\\_genelgeleri/6408866.htm](http://uye.yaklasim.com/filezone/yaklasim/tummevzuat/sgk_genelgeleri/6408866.htm)).

#### 4. Empirical model and the data

This study tries to reveal the effectiveness of public investments and firm-based investment incentives on employment. Public investments comprise investments for infrastructure and education which can motivate private sector employment. The investment incentive is the incentive of social security premium payments to the private firms which locate in the less developed provinces of Turkey. Hence, a panel data analysis was used by employing data over 10 years.

In order to assess the quantitative analysis of the effects of the public policy instruments (public investments and the firm-based investment incentives) on regional employment for the period 2002- 2011, a simple panel regression can take the following form:

$$\text{LogEMP}_{it} = \beta_0 + \beta_2 \text{INVINC}_{it} + \beta_3 \text{LogEDU}_{it} + \beta_4 \text{LogINF}_{it} + \varepsilon_{it} \quad (1)$$

where  $\text{LogEMP}_{it}$  is the log of the number of compulsory insured persons in the private sector in province  $i$  at time  $t$ ,  $\text{INVINC}_{it}$  is the dummy variable taking the value one if firm-based investment incentives are applied in province  $i$  at time  $t$  and otherwise zero. A significant positive value indicates that the firm-based investment incentive has a positive effect on regional/provincial employment.  $\text{LogEDU}_{it}$  is the log of the public investments for education in province  $i$  at time  $t$ ,  $\text{LogINF}_{it}$  is the log of the public investments for infrastructure in province  $i$  at time  $t$ .

The annual data on employment, public investments for education and infrastructure and firm-based investment incentives data at provincial levels were employed for the aim of the study. The data set covers the time period of 2002–2011 for the NUTS 3 regional level (eighty one provinces) of Turkey. The total number of compulsory insured person in the private sector was used as a proxy for employment. The data was taken from the Social Security Institutions (SSI) for each province. The data for the public investments were taken from the SPO. Instead of using total public investment, public investments for education and infrastructure were included in the model to analyse the impact of specific public policy in stimulating regional employment creation. The infrastructural investments were found by the calculation of energy and transportation investments which are related to output growth and then employment creation in the provinces. The variables were converted into real values using various investment indices. Investment deflators were also obtained from the SPO for the entire period. All the variables are used in logarithmic forms in the study. In



order to analyse the effect of firm-based investment incentives within the context of Law No. 5084 a dummy variable was formed for a total of 49 provinces that takes a value of 1 for 36 provinces from 2004 to 2011 and for 13 provinces from 2005 to 2011 after the extension of the law in 2005.

## 5. Estimation results

The model (1) was estimated using the panel data regression with one-way fixed effects. Fixed-effect estimation is preferred because the analysis covers the overall provinces and accounts for time-invariant, unobservable heterogeneity among provinces. This choice also corresponded to the results of the F test, which is employed to determine whether to use the fixed-effect estimator or pooled ordinary least squares (OLS). The Hausman (1978) specification test also confirms the presence of fixed-effect model estimation (within estimator). A Hausman specification test shows that the individual effects and the explanatory variables are correlated, therefore indicating that a fixed effects model should be used since a random effects model would be biased (Krumm and Strotmann, 2012; Wooldridge, 2010). During the estimation process, an autocorrelation problem was detected. For this reason, to eliminate the autocorrelation problem, the AR (1) term was included in the equation estimation. The AR (1) term is found to be statistically significant, showing the series does not contain any unit root (Maddala and Wu, 1999; Choi, 2001; Levin, Lin and Chu, 2002). Table 1 summarises the fixed-effects estimation outcomes of the effects of investment incentives and public investments on employment in NUTS 3 regional level (provinces).

Dependent variable: <i>LogEMP</i>				
	Coefficient	Standard Error	t-Statistic	Prob.
<i>C</i>	4.2948	0.276	15.583	0.000*
<i>INVINC</i>	0.0657	0.016	4.004	0.000*
<i>LogINF</i>	0.0129	0.003	3.972	0.000*
<i>LogEDU</i>	0.0122	0.005	2.041	0.041**
<i>AR(1)</i>	0.9284	0.012	74.807	0.000*
R-squared	0.996	Mean dependent var.		8.925
Adjusted R-squared	0.996	S.D. dependent var.		6.606
S.E. of regression	0.191	Sum squared resid.		21.465
F-statistic	2157.88	Durbin-Watson stat.		1.969
Prob(F-statistic)	0.000			

Notes: \* and \*\* denotes 1% and 5% levels respectively

**Table 1:** Estimation Results of the Fixed Effects Panel Data Model

The results in Table 1 suggest that, as expected, all the estimated coefficients that affect the employment in NUTS 3 regional level (81 provinces) of Turkey are positive and significant at the 1% and 5% levels of significance. Thus, the results suggest that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. In line with the expectation, the investment incentive which was given to private firms in the less developed provinces to support the share of employers' social security premium

payments is significantly effective on employment. Considering that the total number of compulsory insured persons in the private sector is a proxy for employment, this positive relationship is meaningful. Although the employment growth rate was higher in the provinces under the scope of Law No. 5084 than other provinces also stated in (Eser, 2011), it is important to consider that Law No. 5084 is a firm-based investment incentive and firms, under the condition of at least employing 10 employees and locating in the less developed provinces, can benefit from the insurance premium incentives. In this context, because the employment data that was used in this study comprises the total number of compulsory insured persons in the private sector, it is important to take notice of the increased number of insurance registered workers. Also, as stated in Eser (2011) and Turkish Employment Agency, it was found that some firms try to use Law No. 5084 illegally. To benefit from the advantages of the incentive, by employing at least 10 employees, some firms recorded employees that work informally or else, without working, some firms recorded their relatives to provide insurance facilities. For this reason, although during the interpretation of the analysis it is difficult to prove, it is important to take this special issue into consideration.

The second variable - public investment for infrastructure - is also positively related to employment. A sufficient infrastructure system in the region will attract private firms and individuals and then, by increasing production and employment, it will boost regional development. According to the new economic geography, transportation infrastructure is the basic factor which determines firms' location decisions and the scale of economic activities (Krugman, 1991a; Venables, 1996). Firms will agglomerate in the regions where low energy costs and transportation facilities are provided. Regions which provide lower energy costs will attract more investment and then create employment. To cope with global competitiveness, firms should consider low cost production, productivity and access to large markets (Demir and Sever, 2008). In this case, especially in the less developed countries, not only aiming to boost national development but also aiming to reduce regional disparities by providing a sufficient infrastructure system will attract private investment, create employment and increase development.

Another significant variable that has a positive impact on employment is public investment in education. Returns on investment in education based on human capital theory have been estimated since the late 1950's (Psacharopoulos and Patrinos, 2002). Human capital theory puts forward the concept that investments in education increase future productivity. In this context, public investments on education indirectly affect the private sector by increasing the productivity and the efficiency of labour and also contribute to the reduction of regional disparities. Educated, productive, skilful, capable of using high technology and highly qualified workers will affect the production, income and development of the regions and therefore countries. Especially in the less developed regions, through public investment on education, different individual opportunities to generate income will converge and boost the employment of labour.

## **6. Conclusion**

In this study, the effect of public investments and investment incentives on the private sector employment at the NUTS 3 regional level (81 provinces) in Turkey was analysed.

Turkey, as a developing country with unbalanced economic development among its regions, uses various public policies such as public investments and investment incentives to reduce regional disparities and to boost private sector performance. Investment incentives and public investments can be considered important public policy tools explaining the spatial distribution of economic activity, and therefore of employment.

In this context, there are two significant public policy tools: public investments (infrastructure and education) which can motivate private sector employment and firm-based investment incentives which are insurance premium incentives applied to private firms which locate to the less developed provinces of Turkey. Within this framework, in the analysis, the implementation of Law No. 5084 which enacted in 2004 is taken into consideration. Law No. 5084 is the most comprehensive and the most recent regulation in Turkey and comprises the incentive of regional investment and employment. Therefore, the effectiveness of the investment incentives was analysed under the scope of Law No. 5084 which was applied in 49 less developed provinces. Thereby, the panel data analysis was used by employing data for the period of 2002-2011.

The results indicate that both public investments and incentive investment have a positive impact on employment. Moreover, the estimation results show that provinces where firm-based incentive investment was applied within the context of Law No. 5084 indicate a significantly better effect on employment in the following year. However, during the interpretation of the analysis one should also take into account the faults of the implementation. On the other hand, public investment for infrastructure and education also affected employment positively.

Moreover, the results of the study imply that the presence of public policies, public investments and investment incentives give rise to increase employment in less developed provinces. Although the implementation of investment incentives has been the most debatable issue in Turkey, investment incentives are found to be influential in the less developed provinces. It can be concluded that, provided they are monitored strictly, public investments and incentives could be directed towards less developed regions in order to create employment.

## **7. Bibliography**

1. Akan, Y. and Arslan, İ. (2008) Türkiye' de Sektörel Yatırım Teşvik Belgeleri ile İstihdam Analizi: Doğu Anadolu Bölgesi Üzerine Bir Uygulama (1980-2006). *Çalışma ve Toplum*, 1, 107–119.
2. Ay, H. M. (2005). Yatırım Teşviklerinin Sabit Sermaye Yatırımları Üzerindeki Etkisi. *Selçuk Üniversitesi Karaman İktisadi ve İdari Bilimler Dergisi*, 5(2), 176–184.
3. Buton, K. (1998). Infrastructure Investment, Endogenous Growth and Economic Convergence. *The Annals of Regional Science*, 32(1), 145–162.
4. Choi, I. (2001). Unit Root Tests for Panel Data. *Journal of International Money and Finance*, 20(2), 249–272.
5. Deliktaş, E., Önder, Ö. and Karadağ, M. (2009). The Spillover Effects of Public Capital on the Turkish Private Manufacturing Industries in the Geographical Regions. *Annals of Regional Science*, 43(2), 365–378.
6. Demir, M. and Sever, E. (2008). Kamu Altyapı Harcamalarının Ekonomik Büyüme Üzerindeki Etkisi: Türkiye Üzerine Bir İnceleme (1980-2007). *Marmara Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 25(2), 99–118.
7. Erden, L. and Karaçay-Çakmak, H. (2005). Türkiye'de Yerel Kalkınma ve Devletin Rolü: Bir Yöresel Panel Veri Analizi. *Hacettepe University Journal of Economics and Administrative Sciences*, 23(2), 13–32.

8. Eser, E. (2011). Türkiye'de Uygulanan Yatırım Teşvik Sistemleri ve Mevcut sistemin Yapısına Yönelik Öneriler (SPO Publication No. 2822). Ankara: General Directorate of Economic Sectors and Coordination.
9. Göymen, K. (2008). Milestones of Regional Policy and Practice in Turkey. In Conference Proceedings IASA. Retrieved 28.01.2013 from [http://research.sabanciuniv.edu/8875/1/MILESTONES\\_OF\\_REGIONAL\\_POLICY\\_IN\\_TURKEY.doc](http://research.sabanciuniv.edu/8875/1/MILESTONES_OF_REGIONAL_POLICY_IN_TURKEY.doc).
10. Hausman (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251–1271.
11. İldırar, M. (2004). Bölgesel Kalkınma ve Gelişme Stratejileri. Ankara: Nobel Yayın Dağıtım.
12. İŞKUR (Turkish Employment Agency). (2007). Yatırımların ve İstihdamın Teşviki Kanunu'nun" Etkilerinin Değerlendirilmesi Çalışması. Retrieved 16.01.2013 from [http://statik.iskur.gov.tr/tr/dis\\_iliskiler/5084%20sayili\\_kanunun\\_etkileri.pdf](http://statik.iskur.gov.tr/tr/dis_iliskiler/5084%20sayili_kanunun_etkileri.pdf).
13. Kadioğlu, E. (2007). Bölgesel Dengesizliklerin Giderilmesinde Vergi Teşviklerinin Rolü ve Türkiye Örneği. Unpublished Master's Thesis, Karadeniz Technical University, Social Science Institute, Trabzon.
14. Karaçay-Çakmak, H. and Erden, L. (2004). Yeni Bölgesel Kalkınma Yaklaşımları ve Kamu Destekleme Politikaları: Türkiye'den Bölgesel Panel Veri Setiyle Ampirik Bir Analiz. *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 6(3), 77–96.
15. Karadağ, M., Önder, Ö. and Deliktaş, E. (2004). The Effects of Public Capital on Private Sector Performance in the Turkish Regional Manufacturing Industries. *European Planning Studies*, 12(8), 1145–1156.
16. Kaynar, N. (2001). Teşvik Belgeli Yatırımlarda Sabit Yatırım-İstihdam İlişkisi (1999–2000). Ankara: General Directorate of Economic Models and Strategic Studies, State Planning Organization.
17. Krugman, P. (1991a). *Geography and Trade*. Cambridge: MIT Press.
18. Krugman, P. (1991b). Increasing Returns and Economic Geography. *Journal of Political Economy*, 99(3), 483–499.
19. Krumm, R. and Strotmann, H. (2012). The Impact of Regional Location Factors on Job Creation, Job Destruction and Employment Growth in Manufacturing. *Review of Regional Research*, 33(1), 23–48.
20. Levin, A., Lin, C. F. and Chu, C. S. J. (2002). Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, 108(1), 1–24.
21. Maddala, G. S. and Wu, S. (1999). A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics Special*, 61(1), 631–652.
22. Önder, Ö., Deliktaş, E. and Karadağ, M. (2010). The Impact of Public Capital Stock on Regional Convergence in Turkey. *European Planning Studies*, 18(7), 1041–1055.
23. Özaslan, M., Dinçer, B. and Özgür, H. (2006). Regional Disparities and Territorial Indicators in Turkey: Socio-Economic Development Index (SEDI). In 46th Congress of the European Regional Science Association (ERSA): Enlargement, Southern Europe, and the Mediterranean, Volos, Greece, August 30th – September 3rd.
24. Özkök, Y. (2009). Türkiye'de Yatırım Teşviklerinin Bölgesel Gelişmişlik Bazında Değerlendirilmesi. Unpublished Master's Thesis, Gaziantep University, Social Science Institute, Gaziantep.
25. Pirili, M. U. (2011). Bölgesel Kalkınmada Kamu Yatırımlarının Rolü: Kuramsal Bir Değerlendirme. *Ege Academic Review*, 11(2), 309–324.
26. Porter, M. (1990). *The Competitive Advantage of Nations*. London: Macmillan.
27. Psacharopoulos, G. and Patrinos, H. A. (2002). Returns to Investment in Education: A Further Update (World Bank Policy Research Working Paper No. 2881). Washington (DC): World Bank.
28. Revenue Administration. (2006). Tax Incentives for Rising of Investment and Employment. Retrieved 30.01.2013 from <http://www.gib.gov.tr/index.php?id=820>.
29. Social Security Institution (SSI). (2009). The application of Law No 5084 Article 4. Retrieved 25.01.2013 from [http://uye.yaklasim.com/filezone/yaklasim/tummevzuat/sgk\\_genelgeleri/6408866.htm](http://uye.yaklasim.com/filezone/yaklasim/tummevzuat/sgk_genelgeleri/6408866.htm).
30. State Planning Organization (SPO). (2006). 9th Development Plan (2007–2013). Retrieved 16.01.2013 from <http://ekutup.dpt.gov.tr/plan/plan9.pdf>.
31. Sturm, J. E., Jacobs, J. and Groote, P. (1999). Output Effects of Infrastructure Investment in the Netherlands, 1853–1913. *Journal of Macroeconomics*, 21(2), 355–380.
32. Venables, A. J. (1996). Equilibrium Locations of Vertically Linked Industries. *International Economic Review*, 37(2), 341–359.
33. Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data (2nd ed.)*. Cambridge: MIT Press.
34. Yavan, N. (2011). Teşviklerin Bölgesel Ekonomik Büyüme Üzerindeki Etkisi: Ampirik Bir Analiz. *Ekonomik Yaklaşım*, 22(81), 65–104.
35. Yıldırım, J. (2005). Regional Policy and Economic Convergence in Turkey: A Spatial Data Analysis. In 18th European Advanced Studies, Institute in Regional Science. Krakow; Lodz: ERSA.