



# Active Labour Market Policies and Macroeconomic Variables on Employment, Informal Employment and Income Effects: The case of Turkey

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## ABSTRACT

In this empirical research, the effects of macroeconomic variables and the incentive policies implemented in Turkey on the employment, informal employment and income have been investigated in Turkey. Electricity consumption (Economic Growth), the USD/TL exchange rate and inflation variables were used as the macroeconomic variables. The employment incentives that are implemented by the Laws Number 5510, 25510/16322, 26322, 6111, 14857 and 05746/15746 among the employment incentive policies implemented in Turkey were used as variables. The first lagged values of employment incentives from the Laws No. 5510, 26322 and 6111 significantly affected informal employment. The first lagged values of the variables of economic growth as the macroeconomic variable and Law No. 5510 have a positive effect on reducing informal employment. As a macro-economic variable, USD/TL exchange rate has a negative and relatively high efficiency.

**Keywords:** Employment, Informal Employment, Income, Employment Incentives, Active Labor Market Policies

**JEL Classifications:** JO8, O12, E24

## 1. INTRODUCTION

When the unemployment phenomenon is examined throughout the historical process, it appears for the first time in modern economies. It is not possible to talk about the unemployment problem in pre-modern agricultural societies. With the Industrial Revolution, the advancement of science and technology has led to a decrease in the need for humans and the problem of income distribution. Depending on this, the problem of unemployment in the economy remains a problem which is pending before the policymakers due to the failure to realise full employment in modern economic systems. Mainly the great economic crisis in 1929 caused a rapid increase in unemployment and also triggered different social problems. In the 1930s, public investments and direct expenditures - the most important economic tools in the

context of Keynesian Economic Theory- were used to fix the issue of economic crisis. The efficiency of passive policies in Keynesian Economic Theory based on transfer expenditures has been criticised from time to time by economists. However, the problem of unemployment has emerged once again as the biggest problem in the world economies after the oil crisis in 1973. Especially after 1973, active Labor market policies developed by the Swedish employment officer Gösta Rehn were begun to be preferred in the fight against unemployment in developed economies. In the context of macroeconomic policies, the importance of Labor employment policies have been increasing in the world, especially in developed countries. After the Industrial Revolution, the rapidly developing production processes in Europe created a huge added value. Thus, the growing production industries started to require a very high number of skilled Labor. The rapid growth of the

production industry in capitalist economic systems pushes these countries to seek new markets. This increase in production also requires determining new policies and strategies to guide new employment policies and Labor mobility within the country. In this context, significant studies have been carried out on the national as well as supra-national levels. While active Labor market policy practices have been first seen in Sweden, they have increased their reputation among the policies aimed at increasing employment by various international organizations such as OECD, European Union and World Bank. Policymakers become important in the realization of the economic targets in the fight against unemployment. Whereas unemployment is a problem that needs to be solved in developing countries as well as in developed countries, its solution is based on different structural reasons. Especially the instability experienced after the big economic crises decreases the Labor force participation rates and also increases unemployment.

The economic crises in the developing countries lead to an increase in unemployment, and the increase in unemployment rates necessitate the implementation of the above-mentioned active Labor force policies. Employment incentives are very important in the active Labor market, and the insurance premium discounts and subsidies provided to employers during economic shrinkage have employers breath freely again. With such policies, it will be easier to overcome the general economic, regional or sectoral crises, and it will be very difficult to increase employment by regulating the economy without implementing any policy. The Western European-based industrial revolution and effective employment policies were closely followed by policymakers in our country. Active Labor employment policies which date back to old times both in literature and practice are becoming increasingly important in the economic system in Turkey. The need for energy in developing countries is the most important factor in economic development. In addition, when the studies in the literature are examined, It is seen that there is a relationship between the economic growth and energy consumption of developing countries. Since Turkey also falls into the group of developing countries, energy consumption data were used in our study in determining the country's economic growth as the macroeconomic variable.

In this study, the effects of employment incentives and macroeconomic variables being implemented in Turkey on the employment, informal employment and income were examined. In this context, active and passive Labor employment policies were explained, and the studies on Labor and employment policies that are being implemented in Turkey and around the world are summarized in the literature review. The data set, in which the employment incentives and macroeconomic variables are independent; the employment, informal employment and income variables were dependent variables, was analysed and the results of the analysis were interpreted. Finally, the study was completed with conclusions and recommendations.

## 2. LITERATURE REVIEW

The developing countries such as Turkey has struggled the economic crisis and suffered unemployment issue more than

developed countries. The main reason of economic issues could be the fast population growth, internal and external migration, insufficient income, technological developments, differences in interregional development, negativities in investment policies and problems in education policy. Those different issues determine the importance and characteristics of the employment and unemployment problem (Gediz and Yalçınkaya, 2000:180). Also, the quality of the workforce cannot meet the needs of the industry, political and economic instability that cannot be stabilized, urbanization, insufficient investment in the public and private sectors, the skill level of the workforce are problem in developing countries. In addition, the rising exchange rate in interest and foreign trade terms, the need for qualified workforce in an environment of rapid technological changes and increasing competition, capacity utilization many factors such as the inadequacy of unemployment rates, the education that should be provided to entrepreneurs the size of unemployment in our country and make the unemployment problem even more complex (Ersoz et al., 2007:92).

### 2.1. Labor Employment Policies

In a study on the American economy in 1962, known as Okun's Law, it was stated that there was a negative relationship between growth and unemployment. In other words, it has been stated that only real growth will increase employment. However, this is not the case for every country. Because According to Walterskirchen (1999), production should increase faster than labour productivity with economic growth (Walterskirchen, 1999).

Labor Employment Policies refer to the whole of different measures and programs implemented for enhancing Labor mobility, increasing employability in the Labor market, improving Labor quality and skills, fighting against unemployment. The target group of applied Labor policies change according to the economic conditions, political and social goals and Labor dynamics. Significant parts of the Labor market interventions of the executives who dominate the economic policies in developed countries are the subsidy programs that are applied to increase the employment. Particularly in the context of the European Employment Strategy, the interest of European politicians and academics in the evaluation of the efficiency of active Labor market policies has been increasing in recent years (Kluge, 2006). Employment policies are divided into two groups as active and passive policies.

### 2.2. Passive Labor Employment Policies

The passive Labor employment policies are applied in the periods when the employees, who are registered in the Social Security Institution and in whose name the premiums are paid, fall out of their work. While passive Labor policies gain rather social importance, they include economic measures to protect workers' living standards rather than becoming effective in the Labor market. In addition, they appear as the policies applied in order to prevent the excessive decreases in the economic standards and welfare levels of the employees. (Yavuz, 2017). In our country, it is present in the form of Unemployment Insurance, Wage Guarantee Fund and Short Working Allowance in implementation.

### 2.3. Active Labor Employment Policies

Active Labor employment policies are the subsidies to increase employment, to prevent employees from quitting their job and from regulating wage imbalance among employees (Brown et al., 2011). Active Labor employment programs also target the unemployed and the working staff by taking the Labor demand requirements into account (Kuddo, 2009).

Active Labor employment policies are important in terms of decreasing layoffs and costs, in particular by strengthening the position of employees in the Labor market during recovery. It is thought that employment policies provide a competitive advantage to firms in developing and economically vulnerable countries and have a positive effect on increasing their employment (Brown and Koettl, 2015). Active Labor market programs contain the provision of financial assistance to employers in order to create more employment through the protection of existing employment. In terms of employees and job seekers, it provides shortening of the unemployment period, reduces the economic inequality among workers, and contributes to gaining of expertise through vocational training.

Active Labor employment policies are often implemented due to rising unemployment during the economic crisis faced by developing countries. Practitioners benefit from these policies to prevent unemployment, to subsidize employment and to provide vocational training services in economic crises (Brown and Koettl, 2015). States may also adopt these measures to improve the situation of disadvantaged groups in the Labor market and provide them with equal opportunities. Employment subsidies may also subsidize investments, as they are explicitly involved in Labor markets, although they clearly have the function of increasing employment. Investment subsidies are a means to increase economic growth and employment (Fuest and Huber, 2000).

Some economists and policymakers have sought to produce policies towards direct subsidization of employment. For example, some European Union countries are discussing a general wage subsidy such as the financialization of social security financing of employers (Kaldor, 1936). When it is aimed to increase employment through the investments, the effects of the investments on employment will not be felt in the short term as it takes time for the investment plans to be recognized (Nadiri, 1969). For example, if higher profits lead to higher investments, investments and employment are expected to increase when taxes on corporate profits decrease. However, direct investment subsidies may not create any additional employment if the substitution effect prevails (Kesselman et al., 1977).

#### 2.3.1. Types of active labor employment policies

Different active Labor employment programs are implemented in the Member States of the European Union and in other countries in Europe. It is possible to split active Labor employment policies into six basic categories (Kluve, 2006).

- Measures such as Labor market training, job shadowing and work experience,
- Private sector subsidy programs, measures aiming at increasing the professional skills of employers, employees or job seekers with respect to private sector employment;

- Direct employment programs in the public sector, direct creation and provision of other activities in which public goods or public services are produced,
- Services and sanctions, all measures to improve job seeking efficiency,
- Special programs for disadvantaged and unemployed young people, including youth programs, training programs, wage subsidies and job search assistance, related to the target groups of active Labor employment programs;
- Occupational rehabilitation for individuals with disabilities and physical rehabilitation, sheltered workshops and wage subsidies are the six basic categories.

#### 2.3.2. Negative effects of active labor employment policies

##### 2.3.2.1. Dead weight effect

If subsidized workers are employed even without subsidies, a deadweight effect may occur. In this case, wage subsidies are unnecessary, and private employment is prevented. Employment funds released in the scope of the subsidy are used by the firm (instead of employment) in another field (Kangasharju, 2007). In addition, the dead weight effect decreases the cost-effectiveness of active Labor employment policies. For example, the cost effectiveness of employment policies is reduced, the workers, who will be employed even if there are not subsidies, are employed through recruitment subsidies (Brown et al., 2015).

##### 2.3.2.2. Skimming Effect

If skilled workers with high employment prospects are selected, the goal is realized during the program process, and the program may seem successful. (Rodriguez-Planas, 2010). However, the implementation of subsidy programs on skilled workers or jobseekers is positive in terms of the program's success but negative in terms of employability. It is because, for the unskilled workers and inexperienced workers, a negative process will be encountered in recruitment.

##### 2.3.2.3. Displacement effect

The effect of displacement can be reduced if long-time unemployed people re-join in employment, improve their professions, improve their skills, and improve their long-term employability (Brown et al., 2011). According to Martin and Grubb (2001), the displacement effect is valid only in the short term.

##### 2.3.2.4. Substitution Effect

The Labor costs will change with the subsidy programs that are applied to employers. In this case, another skill category can be included in a worker's skill class. Thus, the substitution effect occurs. The substitution effect indicates substitutability between different skill groups. For example; firms can take advantage of incentives to buy low skilled workers instead of medium skilled workers (Brown et al., 2015).

##### 2.3.2.5. Wage effect

Is defined as increasing the wage for existing workers instead of creating new employment with the resources of employment policies. Wage effect reduces the effectiveness of policies (Brown et al. 2011).

### 2.3.2.6. Locking-in effect

It is also called a holding effect. The employees who take advantage of active Labor employment policies may spend less time for job seeking in the periods they become unemployed and may have higher rates of employment than the employees who cannot benefit from these programs (Van Ours 2004).

### 2.3.2.7. Stigmatizing effect

Participants who take advantage of active Labor employment policies may have negative effects on the future employment possibilities. The employer may not be satisfied with the personnel benefiting from subsidy programmes or resign to employ the personnel who can benefit from the program due to staff inefficiency (Calmfors, 1994).

### 2.3.2.8. Skill acquisition effect

Active Labor employment policies reduce the wage difference between unqualified and skilled workers. Vocational training of unskilled workers can have a negative impact (Oskamp and Snower, 2006).

## 2.3.3. Positive effects of active labor employment policies

### 2.3.3.1. Competition effects

Employers use the advantages of incentive programs such as Labor costs, dismissal costs and training costs of new staff. The impact of competition strengthens the position of employees, and thus the employment does not decrease (Lindbeck and Snower, 1988).

### 2.3.3.2. Threat effect

It is the effect of methods in which the possibility of participation is high (contrary to the lock-in effect), that is, the policies that increase the job search of the unemployed, in active Labor employment policies (Lalive et al., 2005).

### 2.3.3.3. Transition effect

It is the shortening of time losses of the personnel's in seeking a job with the implemented incentive programs and is the continuation of workers' working life without any loss in their work experience and skills (Hujer et al., 2006).

### 2.3.3.4. Screening effect

It occurs when enterprises choose the subsidy program for personnel recruitment, they are interested in staff suitable for the program. Thus, they have a definite knowledge of the efficiency and productivity of the staff they will hire (Gerfin and Lechner, 2002).

### 2.3.3.5. Budget effects

If employment can be increased with the effect of incentive policies, there will be savings in the general budget since there will be a decrease in unemployment compensation and social assistance and an increase in the premiums collected (Carling and Richardson, 2004). Therefore, tax increases should not be made in the periods when incentive policies are implemented. A tax increase will adversely affect the incentive program (Calmfors, 1994).

## 2.4. Studies on the Labour Employment Policies Implemented In Turkey and in the World

In the researches carried out on the employment, theoretical analyses are statically and therefore, and it is observed that there

are only short-term effects of employment policy and the results are similar to each other. However, there are also studies suggesting that its long term effect is more important. It is considered that employment incentives have an impact on the transition from unemployment to employment (Brown et al., 2011). When the usage rate of wage subsidies in specific groups was lower than targeted, it was effective on economically disadvantaged young people and adults. When the wage subsidies were used in conjunction with business development, training and job search assistance efforts, it was seen that they were successful in improving the employment and earnings of targeted disadvantaged groups. In addition, economists have proposed subsidies to improve the earnings and employment of low-wage workers. (Katz, 1996).

In a study by Pissarides (1998), it has been determined that a collective payment subsidy which corresponds to 20% of the pre-tax wage decreases unemployment by 4% and the pre-tax wage increases by 13%. Leary (1999) made research about self-employment programs for Poland and Hungary. Positive employment effects were expected for both countries. When the results were examined, there were strong positive earnings effects for Hungary, and the income effect was negative for Poland. Heckman et al. (1999) conducted an econometric analysis about the Employment Strategy programs implemented in Europe before 1994. This study provides a comprehensive summary of microeconomic studies for the US and Europe. According to this, US researchers conducted studies on the effects of the Employment Strategy programs in the mid-1970s. European researchers have begun to use these programs by expanding their scope. While European countries focus on unemployed youth, the United States has focused on disadvantaged unemployed people of all ages. Researchers studying the incentive policies implemented in the United States assert that government employment and education programs can improve the economic well-being of low skilled individuals and have significantly different effects on different demographic and skill groups. European researchers have not come to a conclusion on the effect of any active Labor policy on employment.

Meager et al. (2003) concluded that there was no significant impact of the subsidies, which were implemented in the UK by Prince Trust for young people to start a business, on employment and the opening of new businesses. According to Martin et al. (2004), the incentive program that the UK government implemented in order to create new opportunities for young people in the Labor market includes comprehensive employment and wage subsidies for employers. When the results of the program are examined, it is determined that the incentive applied for recruitment increases employment by about 5%, but in the long term, its effect is very low. Kramarz and Philippon (2001) reported that even though the incentive on payroll tax and the changes in the minimum wage cost in France decreased the costs of incentives on employment, they did not affect the employment; Goos and Konings (2007) found that the program which was called as "Maribel subsidies" in Belgium and was implemented in the late 1990s had an impact on low wage workers and was effective on improving the employment expectations of employees.

### 3. DATA AND ANALYSIS

#### 3.1. Data Used in the Study

In the study, the effects of employment incentives by Laws No. 05510, 25510/16322, 26322, 6111, 14857, 05746/15746 applied to the private sector by Social Security Institution between the years of 2012 and 2016 on the employment, unregistered employment and monthly average income were investigated. In addition, the effects of the macroeconomic variables; economic growth, the change in the dollar exchange rate and the inflation rate on the employment, informal employment and monthly average income were also examined. As the economic growth variable, electricity consumption data were used. This is due to the fact that there has been found a relationship between the energy consumption and the economic growth of countries in a study made by using data from more than 100 countries for the world economy by Wolfram et al. (2012). Regarding the findings obtained in econometric analyses to be reliable, it is necessary to be stable in the level values of the series to be used in the analyses or to be co-integrated with the series in each model (Uzgoren, 2005). In this context, the stability of the series is investigated by structural fracture tests developed by ADF (Augmented Dickey and Fuller: Expanded Dickey Fuller) developed by Dickey and Fuller (1981), PP (Phillips and Perron) developed by Phillips and Perron (1988) and Vogelsang and Perron VP (Vogelsang and Perron).

However, it is not possible to associate the electricity consumption data with growth as the energy needs of the developed countries are provided from different sources. As our country is in the group of developing countries, energy consumption data could be used as country growth data.

The variables used in the study;

- Employment rate (Employment, %)
- Informal employment rate (Informal employment, %)
- Monthly average income (Average Monthly Income, TL)
- Monthly electricity consumption amount (Economic Growth, kw)
- United States of America dollar exchange (USD/TRY Exchange Rate, %)
- Monthly change in consumer price index (Inflation, %)

Employment incentives applied to the private sector with variables;

- Five-point discount incentive implemented by Law No. 05510 (5510, Million TL)
- The incentive applied in accordance with decisions on state aid in the investments implemented by the Law No. 25510/16322 (25510/16322, Million TL)
- The incentive applied in accordance with the decisions on state aid in the investments implemented by Law No. 26322 (26322, Million TL)
- The incentive for the employment of young and women in accordance with Law No. 6111 (6111, Million TL)
- The incentive provided in the employment of the disabled with insurance in accordance with Law No. 14857 (14857, Million TL)
- Research and development incentive applied in accordance with the Law No. 05746/15746 (05746/15746, Million TL)

Huttunen et al. (2013) showed in their study that the subsidy programs applied in Finland were not highly effective in increasing employment, however, they increased the working hours in industrial sector by providing full time working of some part-time employees, contributed to the increase of salaries even though the results related to the general effects on the wages were uncertain, and the subsidies were not as effective as desired or the wage demands of workers were not flexible especially in the employment of unskilled workers. Deidda et al. (2015) argue that the program applied in the Southern Region of Italy called Interventions for Social Cohesion (*Interventi di Coesione Sociale*) reduce the recruitment costs of firms and that the training services offered by the program do not benefit the informal workers, although they are beneficial for the unemployed. In the study by Betcherman et al. (2010), the effect of employment subsidy program on the registered employment, earnings and the number of registered organizations have been analysed in accordance with Laws No. 5084 and 5350 in Turkey. Although the data were sufficient, it was found that the dominant effect of subsidies increased social security records of firms and workers rather than increasing total employment and economic activity.

In his study about the impact of a policy aimed at encouraging the employment of women and young people in Turkey in 2008, Ayhan (2013) examined the role of non-wage cost rigidities that were slowing down the employment creation. The employment effect of the decrease in social security premiums in employer contribution was evaluated by using the differentiation strategy in differential differences. The reduction in costs had a positive effect on the increase of employment and prevented women's withdrawal from the Labor market, but did not encourage women outside the subsidy to start looking for a job shortly after the announcement of incentive policies in the targeted groups. Uysal (2013) conducted a study focusing on the effects of social security contributions being implemented in Turkey on the employment of women in the 30-44 age group. It has been observed that the incentives have a positive effect on the employment of married women with low education level, and companies that benefit from the incentives are mostly large-scale companies operating in the industrial sector. However regional incentives, tax incentives, etc. and other incentives etc. have undermined the positive effects of this policy. Accordingly, it has been emphasized that policy makers should consider all possible interactions between incentives when designing laws and regulations. Aksoy (2013) investigated the relationship between general and industrial growth and the employment and the effects of investment and employment incentives on employment in Turkey. The study indicated that the incentive Law No. 5084 had a statistically significant effect on employment in the social services, manufacturing, transportation and trade industries. The incentive Law No 5763 was found to have a statistically significant effect on energy consumption and distribution and employment in financial intermediation industries. In the literature research, it is seen that active Labor market policy programs applied in developing countries are more effective in the regions where disadvantaged groups are selected as the target group, unqualified individuals are predicated in occupational group selection, and which have short-term and high unemployment rates in program period selection.

Data were obtained monthly for 2012 and 2016 period. Employment incentive data applied in accordance with the Laws No. 05510, 25510/16322, 26322, 6111, 14857, 05746/15746 were obtained from Social Security Institution, and energy consumption data was obtained from Energy Market Inc. through government correspondence. Data related to other variables were gathered from the web sites of TSI<sup>1</sup>, Central Bank of the Republic of Turkey<sup>2</sup> and the Social Security Institution.<sup>3</sup> Financial data were withdrawn to the 2<sup>nd</sup> month's level by using 2012 consumer price index, and real values were used instead of nominal values.

Besides, the amount of subsidies applied in 12<sup>th</sup> month of 2016/1 insured to insured persons notified to Social Security Institution in accordance with the Laws numbered 05510, 25510/16322, 26322, 6111, 14857, 05746/15746 were specified in Table 1. 2016/12 According to SSI's official data per month, the average gross earnings of employees insured with 4A are taken from the Central Bank's website<sup>4</sup> by taking the amounts based on foreign exchange sales (3.53TL) as of 30.12.2016, and the amounts are stated in USD in Table 1.

### 3.2. Results of Analysis

As the data were on a monthly basis in the study, the Augmented Dickey Fuller (ADF) test was performed to determine whether the seasonally adjusted series with the tramo/seat method was stationary and the non-stationary series on the level were stabilized. Following the stabilization of all variables, the appropriate delay number was determined by using Schwartz Information Criteria (SIC) for VAR analysis, and Granger Causality analysis was performed to determine the order of the variables for entering into the VAR analysis. Then, the VAR model was established and the effects of incentives on employment, informal employment and income were examined.

#### 3.2.1. Augmented dickey fuller test

Unit root tests developed by Dickey-Fuller do not only apply to first-order autoregressive processes. It is possible to apply Dickey-Fuller tests to higher degree autoregressive processes. In this case, the error term  $\varepsilon_t$  will not be in the form of a stochastic but will be serial correlated. In such a case, the Dickey-Fuller test process will be invalid. Therefore, the serial correlation in error terms must be eliminated. For this purpose, the correlation in the errors is eliminated by adding the lagged values of the variable to the model. The applied test, in this case, is called the Augmented Dickey-Fuller (ADF) test. The regression equations for the ADF test are the same as in the Dickey-Fuller test, and the only difference is that the lagged values of the variable are added to the model.

Results of the ADF test related to our data are indicated in Table 2.

If the variables in the table of ADF test results have not significant P values without being taken their first-order difference, they are retested

1 (<http://tuik.gov.tr/UstMenu.do?metod=kategorist>)

2 (<https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Istatistikler/Doviz+Kurlari>)

3 ([http://www.sgk.gov.tr/wps/portal/sgk/tr/kurumsal/istatistik/aylik\\_istatistik\\_bilgileri](http://www.sgk.gov.tr/wps/portal/sgk/tr/kurumsal/istatistik/aylik_istatistik_bilgileri))

4 [https://www.tcmb.gov.tr/kurlar/kurlar\\_tr.html](https://www.tcmb.gov.tr/kurlar/kurlar_tr.html)

by taking their first-order difference. Variables were renamed by placing "D" at the beginning. In the tests made with 95% confidence level, as can be seen from Table 2 the employment variable series is integrated in the first order ( $t = -4.77$ ,  $P = 0.000$ ). Informal employment variable is stationary at level ( $t = -3.38$ ,  $P = 0.000$ ). The income variable series is first order integrated ( $t = -8.01$ ,  $P = 0.000$ ). Economic Growth variable series is integrated at the first order ( $t = -13.18$ ,  $P = 0.000$ ). USD/TL Rate/TL Rate variable is stationary at level ( $t = -4.08$ ,  $P = 0.000$ ). Inflation variable is stationary at level ( $t = -4.08$ ,  $P = 0.000$ ). The 5510 variable series is integrated in the first order ( $t = -6.89$ ,  $P = 0.000$ ). 25510/16322 variable series is integrated in the first order ( $t = -6.13$ ,  $P = 0.000$ ). 26322 variable series is integrated in the first order ( $t = -8.56$ ,  $P = 0.000$ ). 6111 variable series is integrated in the first order ( $t = -5.47$ ,  $P = 0.000$ ). D\_14857 variable series is integrated in the first order ( $t = -6.27$ ,  $P = 0.000$ ). 05746/15746 variable series is integrated in the first order ( $t = -5.11$ ,  $P = 0.000$ ). In summary, as a result of conducted ADF tests, employment, income, economic growth, variables of 5510, 25510/16322, 26322, 6111, 14857, 05746/15746 were found to be integrated in the first order, other variables were stationary at level.

#### 3.2.2. Vector autoregressive models

VAR models are primarily used in the analysis of the relationships between macroeconomic variables and the dynamic effect of random shocks on the system of variables. The relationships between variables in VAR modelling based on the Granger Causality Test are examined via Variance Decomposition and Impulse-Response functions. VAR modelling is highly sensitive to the selected delay length. In VAR analysis, the lag length of the variables that will enter the model must be long enough to capture the dynamic relations between the variables. VAR models are a linear function of both the lagged values of each variable in the system and the lagged values of other variables. In this case, if there are no restrictions, the right side of each equation in the VAR model will contain the same variables. Moreover, the lagged values of the dependent variables in VAR models make it possible to make strong predictions for the future.

In VAR modelling, it is preferred that the series are stationary because the shocks in the stationary time series are transient, in other words, the effect of a random shock given to the system is lost over time, and the series returns to long-term equilibrium levels. For non-stationary time series, the shocks are permanent. In VAR modelling, the error term for each equation is constant standard deviated white noise processes, and these error terms are not auto correlated among themselves (Akan and Kanca, 2015). In order to determine the lag length in our study, Schwartz Information Criterion was used, and tests were made up to the 3<sup>rd</sup> delay. Accordingly, the values for each delay length are given in Table 3.

According to the results in Table 3, the delay length that makes the SC value the smallest can be determined as the most appropriate delay number. Accordingly, the 1<sup>st</sup> delay can be considered the most appropriate delay with a value of 27.84. As the VAR analysis is sensitive to the lag length, it is also important that the variables used to measure the variables' response to the shocks and to investigate the source of the changes in the variables are sorted within the system. For this purpose, it is recommended that the

**Table 1: Incentive calculation chart**

Type of incentive	Income dependent on social security contributions* limit based on incentive	Law number	Calculation of incentive amount				
			Average gross earnings (\$)	Incentive rate (%)	Amount of incentive (\$)	Amount of insurance premium (% 34,5) (\$)	Amount of premium to be paid after the incentive (\$)
Five Points Discount	Incentive Amount. Income Dependent on Social Security Contributions is calculated between the lower limit and the upper limit**	5510	696.62	5	34.83	240.33	205.50
Incentive applied in accordance with Decisions on State Aids in Investments	Incentive Amount. Income Dependent on Social Security Contributions is calculated based on the lower limit (\$ 466.57)	25510/16322	696.62	15.5	72.42	240.33	167.91
		26322	696.62	29.5	137.84	240.33	102.50
Incentive for Employment of Youth and Women (4447/ Provisional 10. Clause)	Incentive Amount. Income Dependent on Social Security Contributions is calculated between the lower limit and the upper limit.	6111	696.62	15.5	107.97	240.33	132.36
Incentive for Employment of Insured Disabled	Incentive Amount. Income Dependent on Social Security Contributions is calculated based on the lower limit. (\$ 466.57)	14857	696.62	15.5	72.42	240.33	167.67
R&D Incentive	Incentive Amount. Income Dependent on Social Security Contributions is calculated between the lower limit and the upper limit.	05746. 15746	696.62	15.5/2	53.91	240.33	186.08

Minimum wage amount for the 12<sup>th</sup> month in 2016 \$ 466.57

Calculated on the basis of a ratio of workers' share of 14.5% and the employer's share of 20.5% (Except for actual service wage increase).

In the notification made with the Law No. 26322, the insured's share is also supplied by the Treasury as well as the employer's share based on the lower limit of Income Dependent on Social Security Contributions.

In the calculation, 5-point discount in disability, old age and death insurance premium have been taken into consideration.

It was assumed that the insured was notified within 30 days.

\*Income Dependent on Social Security Contributions

\*\* Lower Limit: Minimum Wage of the Relevant Period, Upper Limit: 6.5 Times of Minimum Wage of the Relevant Period

variables are sorted from external to internal (Enders, 2008). The fact that the variables are internal or external is basically based on economic theory. Besides, internal-external differentiation regarding the variables can be made with Granger causality analysis.

### 3.2.3. Granger causality analysis

If there is a time-dependent lagged correlation between two variables, one of the tests used to determine the direction of the causality of the correlation statistically is the Granger causality test. For the Granger causality test, first of all, the number of lags in the models must be determined. Since the Granger causality test is based on the VAR model, the number of lags must be primarily determined by using AIC and SC criteria according to

VAR model. In our study, the number of lags was determined by using SC criteria. The results of Granger Causality analysis for the series used are given in the attached Table. The lag length is taken as 1 in parallel with the VAR model. Accordingly, H<sub>0</sub> hypothesis was rejected for the variables of which values are less than 0.1 in conducted 132 test results. (H<sub>0</sub>: X is not a granger cause of Y.)

In this context, according to the Granger Causality test results, the variables can be sorted from external to internal as inflation, D\_employment, informal employment, D\_14857, D\_25510/16322, USD/TL rate, D\_5510, D\_6111, D\_05746/15746 (Research and development incentive applied to employers with document type 05746/15746), D\_Economic Growth, D\_Income, D\_26322. In the study, VAR analysis, which is related to the effect of the

**Table 2: ADF Test Results Related to the Series**

Variables	Without Constant and Trend		With Constant		With Constant and Trend	
	t Statistic	P value	t statistic	P value	t statistic	P value
Employment	2.06	0.99	-1.80	0.38	-1,81	0.69
D_Employment	-4.77	0.00	-5.35	0.00	-5.55	0.00
Informal Employment	-3.38	0.00	-2.08	0.25	0.11	1.00
Income	1.54	0.97	-0.64	0.85	-2.21	0.47
D_Income	-8.01	0.00	-8.37	0.00	-8.30	0.00
Economic Growth	5:59	1.00	4.32	1.00	-1.51	0.82
D_Economic Growth	0.32	0.77	-10.20.	0.00	-13.18	0.00
USD/TL Rate/TL Rate	-4.08	0.00	-4.88	0.00	-5.16	0.00
Inflation	-2.02	0.04	-6.01	0.00	-6.03	0.00
5510	2.11	0.99	-1,39	0.58	-2.33	0.41
D_5510	-6.89	0.00	-7.55	0.00	-7.58	0.00
25510/16322	2.13	0.99	-1,01	0.75	-1.73	0.72
D_25510/16322	-6.13	0.00	-6.96	0.00	-6.96	0.00
26322	6.63	1.00	3.62	1.00	-1.17	0.91
D_26322	-0.35	0.55	-6.49	0.00	-8.56	0.00
6111	2.30	0.99	-1.58	0.49	-1.60	0.78
D_6111	-5.47	0.00	-5.87	0.00	-5.85	0.00
14857	3.86	1.00	0.72	0.99	-1.62	0.77
D_14857	-6.27	0.00	-7.65	0.00	-7.78	0.00
05746/15746	3.01	1.00	0.14	0.97	-1.69	0.74
D_05746/15746	-5.11	0.00	-5.68	0.00	-5.65	0.00

**Table 3: Determining the appropriate lag length for VAR Model**

Number of Delays	Schwartz Information Criterion
0	39.68
1	27.84 *
2	31.71
3	32.14

active Labor employment incentives applied to the private sector on the Labor market. In this framework, first of all, stationarity of the variables were analysed, and the differences of the first order integrated series were taken. Then, since the VAR models were sensitive to the lag length and the order of the variables, the lag length was determined according to the SC criterion, and the variables were sorted from external to internal with the Granger Causality test. As a result, the VAR model was estimated by taking the lag length as 1 and sorting the variables from the external to the internal. Estimation results for the models where D\_Employment, Informal Employment and D\_Income variable are dependent variables are shown in Table 4.

According to the results of VAR model shown in Table 4, the variables affecting employment, unregistered employment and income variables can be summarized as follows.

**3.2.3.1. Variables that affect D\_Employment variable**

The variable of Incentive Law No. D\_5510 (P = 0.06). Incentive Law No. D\_6111 (P = 0.09) and Unregistered Employment variable (P = 0.09) has a statistically significant impact on D\_Employment variable at 10% significance level. When we look at the coefficients of the variables which have a statistically significant impact on D\_Employment variable, we can say that a unit increase in the first lagged value of the Incentive Law No. D\_5510 variable will reduce D-Employment variable by 0.0024 unit, a unit increase in the first lagged value of the Incentive Law

No. D\_611 variable will increase the D\_Employment variable by 0.0093 unit and a unit increase in the first lagged value of the Informal Employment variable will reduce D\_Employment variable by 0.0910 unit.

No statistically significant effect of other variables Incentive Law No. (D\_25510/16322 [P = 0.21] Incentive Law No. D\_26322 [P = 0.14], Incentive Law No. D\_14857 [P = 0.14]. Incentive Law No. D\_05746/15746 [P = 0.20], D\_Income [P = 0.40]. D\_Economic Growth [P = 0.29], USD/TL Rate [P = 0.34], Inflation [P = 0.19]) was observed on D\_Employment.

**3.2.3.2. Variables affecting the informal employment variable**

There is a statistically significant effect of Incentive Laws No. D\_5510 P = 0.02), D\_26322 (P = 0.01), D\_6111, (P = 0.05) and D\_Electricity (P = 0.01) on the Informal Employment variable at 5% significance level. Considering the coefficients of variables with a statistically significant effect on the Informal Employment variable; a unit increase in the first lagged value of Incentive Law No. D\_5510 will decrease the Informal Employment variable by 0.0040 unit, a unit increase in the first lagged value of Incentive Law No. D\_26322 variable will increase the Informal Employment variable by 0.1792 unit, a unit increase in the first lagged value of Incentive Law No. D\_6111 variable will increase the Informal Employment variable by 0.0141 unit, and that a unit increase in the first lagged value of D\_Economic Growth variable will decrease the Informal Employment variable by 0.8268 unit. There was no statistically significant effect of other variables on Incentive Laws No. (D\_25510/16322 [P = 0.46], D\_14857 [P = 0.48] and D\_05746/15746 [P = 0.17], D\_Employment [P = 0.43], D\_Income (P = 0.40), USD/TL Rate (P = 0.13), Inflation (P = 0.13)) Informal Employment.



**Table 4: VAR Model Results**

Variables	D_Employment		Informal Employment		D_Income	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
D_5510 (-1)	-0.0024	<b>0.06</b>	-0.0040	<b>0.02</b>	-0.4830	<b>0.03</b>
D_25510/16322 (-1)	0.0426	0.21	0.0066	0.46	0.5291	0.48
D_26322 (-1)	0.0595	0.14	0.1792	<b>0.01</b>	-2.7594	0.38
D_6111 (-1)	0.0093	0.09	0.0141	<b>0.05</b>	2.6780	<b>0.01</b>
D_14857 (-1)	-0.1096	0.14	0.0058	0.48	25.4043	<b>0.07</b>
D_05746/15746 (-1)	0.1038	0.20	-0.1449	0.17	39.4691	0.03
D_Employment (-1)	0.8644	<b>0.00</b>	0.0151	0.43	-7.1211	0.26
Informal Employment (-1)	-0.0910	<b>0.09</b>	0.8424	<b>0.00</b>	-11.1042	0.16
D_Income (-1)	-0.0004	0.40	-0.0004	0.40	0.3617	0.06
D_Economic Growth (-1)	-0.1400	0.29	-0.8268	<b>0.01</b>	-7.9160	0.43
USD/TL Rate (-1)	0.0048	0.34	0.0170	0.13	-5.1546	<b>0.01</b>
Inflation (-1)	0.0583	0.19	0.0890	0.13	11.2090	0.15
C	13.6486	0.06	22.8442	0.02	1594.3180	0.13
R <sup>2</sup>		0.98		0.99		0.97
F statistics	217.44	0.00	550.90	0.00	120.21	0.00

**3.2.3.3. The variables affecting the variable D\_Income variable** Incentive Laws No. D\_5510 (P = 0.03), D\_6111 (P = 0.01), and D\_05746/15746 (P = 0.03), USD/TL Rate (P = 0.01) variable have statistically significant effect on income variable at 5% significance level, Incentive Law No. D\_14857 (P = 0.07) has a statistically significant effect on income variable at 10% significance level. Considering the coefficients of variables with a significant effect on the income variable, it can be stated that a unit increase in the first lagged value of the Incentive Law No. D\_5510 will decrease the income variable by 0.4830 unit, a unit increase in the first lagged value of the Incentive Law No. D\_6111 will increase the income variable by 2.6780 units, a unit increase in the first lagged value of the incentive Law No. D\_05746/15746 variable will increase the income variable by 39.4691 units, and a unit increase in the first lagged value of USD/TL Rate variable will decrease the income variable by 5.1546 units. No statistically significant effect of other variables on Incentive Laws No. (D\_25510/16322 [P = 0.48], D\_26322 [P = 0.38], D\_Employment [P = 0.26], Informal Employment [P = 0.16], D-Economic Growth [P = 0.43] and Inflation [P = 0.15]) was observed.

## 4. CONCLUSION

The results obtained in our study were similar to those in the literature, which examined the effects of employment incentives and macroeconomic variables on employment, informal employment and income. Employment incentives applied in accordance with the Laws No. 5510 and 6111 affected the employment at statistically significant level. There was no statistically significant effect of macroeconomic variables on employment. Employment incentives applied in accordance with the Laws No. 5510, 26322 and 6111 had statistically significant effect on the informal employment. Only the economic growth variable from the macroeconomic variables made a statistically significant effect the informal employment. Employment incentive variables affecting the income at statistically significant level are employment incentive variables applied in accordance with the Laws No. 5510, 6111, 14857 and 05746/15746. Among the macroeconomic variables, the USD/TL exchange rate had a statistically significant effect. Employment incentives are expected

to have a theoretically positive impact on employment, informal employment and income.

However, due to factors affecting the active Labor employment policies such as dead weight effect, displacement effect, budget effect and wage effect positively and negatively, the results of our analysis emerged contrary to the theoretical expectation. The negative effect of the employment incentive applied in accordance with the Law No. 5510 on employment is explained by the dead weight effect. The positive effect of variables affecting informal employment implies an increase in informal employment and is a negative situation for informal employment. For this reason, it is considered that the positive effect of the employment incentive applied in accordance with Laws No. 26322 and 6111 on informal employment emerges as a result of the displacement effect.

### 4.1. When the Effects of Employment Incentive Laws and Macroeconomic Variables on Employment are Examined

Since the incentive Law No. 5510 is enacted for employers to pay their insurance contributions regularly and to prevent informal employment, the practitioners do not expect the incentives to have a significant impact on employment. In the results of our analysis, it is thought that the probable cause of the negative effect of the Incentive Law No. 5510 on employment, whereas it should have had a positive effect on employment, is the budget effect with the increase in insurance premium costs (Calmfors, 1994) and the dead weight effect (Kangasharju, 2007). In the literature, there are studies in which the negative effect of active Labor employment policies on employment was identified. These studies; Akhmedov et al. (2003), Dorsett et al. (2013) (Long-term effect negative), Hardoy (2005) (Negative effect on unemployment), (Pfeiffer and Reize, 2000) (Negative effect on Employment), Ronsen and Skarohamar (2009) (Negative effect on employment of young people).

The conditions for benefiting from the employment incentive applied in accordance with Law No. 6111 are different from the conditions in other incentive models. The model is rather designed for young and female workers, and its beneficiaries were proposed to be unemployed, and recruitment condition was set as positive

employment in terms of employer and the employer was proposed to benefit from the incentive approximately 40 months. Therefore, the incentive model applied in our country appears as the code with which the increase of employment is targeted for the first time all across Turkey and without making sectoral discrimination. In our analysis, it was seen that the incentive applied in accordance with Law No. 6111 was effective in increasing the employment throughout Turkey. However, it was evaluated that this effect was less than expected in terms of employment, because of the condition that employees whom the employees recruited in the past can also be beneficiaries, there was dead weight effect of the incentive implemented in accordance with Law No. 6111 on employment and its positive effect on employment was broken because of making the employees work more and increasing the wages in the current employment instead of creating employment. In the literature, this effect is called the wage effect (Brom et al., 2011).

It was determined that the incentive implemented in accordance with Law No. 6111 and the policy called Interventions for Social Cohesion (Interventi di Coesione Sociale) applied in the Southern Italy region were similar and that the program applied in the study by Deidda et al. (2015) focusing on the effects of the policy was not effective on employment. Studies that have identified the positive effects of Active Labor Employment Policies on employment were analysed.

#### **4.2. Similar Results have also been Gathered from these Studies**

Caliendo et al. (2012), Caroleo and Pastore (2001), Dengler (2013), Jaenichen and Stephan (2011), Mihaylov (2011), Stephan and Pahnke (2011), Kangasharju (2007), Girma et al. (2008), Baumgartner and Caliendo (2008), Román et al. (2017). In Turkey, the results of the studies conducted by the researchers Ayhan (2013) (positive on Women), Uysal (2013), Aksoy (2013) and Balkan et al. (2014) show similar results with our study.

#### **4.3. When the Effects of Employment Incentives and Macroeconomic Variables on Informal Employment are Examined**

Informal employment is a size that cannot be measured directly but predictable and the only data available is the estimates made by TSI. It is known that the employment incentives implemented by the Social Security Institution are one of many studies implemented to reduce informal employment. The incentive applied in accordance with Law No. 5510 is one of these incentives. In the implementation of the incentive, there is a requirement to not employ informal workers. In our analysis, the positive effect of the program on reducing informal employment coincides with the objective of the incentive.

The reason for the employment incentive law, which is applied in accordance with Law No. 6111, has an increasing effect on informal employment is the displacement effect (Brom et al., 2011). The displacement effect is the situation that the employers hire the employees working under the incentive when their period of benefit is over or to make some of their current staff work informally. In the study by Deidda et al. (2015), it was concluded

that the similar incentive program implemented in the Sardinia region of Italy in 2006-2008 was not effective in reducing informal employment.

The procedure applied in the application process of the incentive program implemented under Law No. 26322 is higher than other incentives. This intensive procedure made it difficult to benefit from this incentive. Therefore, the incentive program implemented did not reduce informal employment. Since the positive effect found in the analysis result is very low, it is concluded that the incentive program implemented in the type of document No. 26322 was not effective in reducing informal employment.

In our country, the reason why the employment does not increase along with economic growth is the implementation of capital-intensive growth model rather than Labor intensive growth (Muratoğlu 2011). For employers, informal employment provides an advantage in competition between firms due to the decrease in employee costs. Especially in the service sector, informal recruitment is easier compared to other sectors. Therefore, even if informal employment decreases with economic growth, this decrease is very low.

#### **4.4. When the Effects of Employment Incentive Laws and Macroeconomic Variables on Income are Analysed; the Effect of the Incentive Applied**

In accordance with Law No. 5510 on income is negative, albeit low. It is possible to find studies in the literature in which the active Labor employment policies have a negative effect on income. Studies of Calmfors et al. (2001) and Medina and Núñez (2005) are examples for this case.

The effect of Incentive Law No. 6111 on income is the reduction of the costs of the employer. Thus, employers pay higher wages to the workers they employ by benefiting from incentives. Since the implemented incentive provide a competitive advantage to employers, it can be thought that employers increase the wages of employees to maintain this advantage. The studies that have identified the positive effects of active Labor employment policies on income were examined: Aedoand and Nuñez (2004) (Especially in women). Jespersen et al. (2008). Jalan and Ravallion (2003). Lise et al. (2004).

The incentive program implemented under Law No. 14857 covers the employment of disabled insured persons. The main reason for the positive effect of the incentive program on income is that all the minimum wage part of the employer's share in insurance premiums in the employment of participants is covered. Employers may increase the wages of the insured as they do not make any cost calculations in the personnel they employ.

The incentive which is implemented in accordance with the document No. 05746/15746 is the R & D incentive program. Since it is applied to the personnel based on their gross wages, it has a decreasing effect in R & D costs of the employers. Thus, the wages of the personnel employed in the scope of the incentive are more than the other personnel.

When the positive effects of active Labor employment incentives on income are analysed, it is seen that incentives decrease the costs of employers. Therefore, it is thought that there is an increase in the wages of the employees. The positive effect of incentives on income is also known as the budgetary effect in the literature.

The increases in the real exchange rate have a negative impact on the purchasing power of the employees. As our country is a country where the imported products are dominant, the increase in the exchange rate has increased the prices of products or services in parallel with the increase in costs. Since this case will create an increase in the costs of employers, it caused the employers to pay less wages to their employees or not to increase the wages. Therefore, the increase in real exchange rate affected income the negatively as expected.

## 5. RECOMMENDATIONS

It is a fact that national and global factors affect the efficiency and success of active Labor market programs. The Labor market, which has a dynamic structure, also varies depending on economic and social factors. Since the benefit and cost analysis of active Labor market programs that have similar objectives are not made effectively, incentives cannot be used efficiently by employers. Furthermore, the complexity of the applied employment incentives makes it necessary for practitioners to receive expert support. Large-scale companies use programs more effectively thanks to their institutional structures and financial possibilities. However, small-scale companies cannot benefit from the programs as efficiently as large-scale companies due to their financial insufficiencies to employ experts related to the institutional capacity and incentives. For this reason, it is necessary to simplify the employment policies or provide consultancy support to the mid-sized companies.

Other factors that reduce the efficiency of active Labor market programs are that the programs are not sufficiently comprehensible by the implementing public agencies and that there is not enough publicity in the Labor market. The fact that the working culture is not mature enough in our country leads employers and employees to informal employment. However, employers have made cost effectiveness analysis with the awareness gained about active Labor market programs and informal employment transformed into registered work. Thus, by eliminating many risks (occupational accidents, occupational diseases, administrative fines, etc.), incentives were benefited from financially in medium and long term, and competitive advantage was provided. For this reason, it is necessary that employment incentive laws should be understandable; promotions should be made related to the programs and employees and employers should be informed about the registered work.

Active Labor market programs will increase the competitiveness of the firms operating in sectors that create added value for the national economy in national and international markets. On the other hand, it is necessary to redesign the employment incentives by taking the regional differences into consideration. The place of culture of entrepreneurship in the country's economies is an undeniable fact. In developed countries, entrepreneurial incentives are applied together with the active Labor market programs. In Turkey, there is a critical deficiency in this area. Among the incentives implemented

by the Social Security Institution of Republic of Turkey, which has a special mission related to active Labor market policies, it would be appropriate to introduce a different employment incentive model in order for the entrepreneurs to open new businesses and provide new employment. In addition, entrepreneurial support is important in terms of preventing informal employment for the Labor market and providing additional employment. Researchers are advised to conduct sectoral, regional and gender based studies on the effectiveness of active Labor employment policies and to concentrate on sectors with high added value for the country's economy.

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