THE FOOTPRINTS OF STAGFLATION IN TURKISH ECONOMY

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***Abstract**: The Inflation, in which most of the countries interfere and which is an important concept, states constant raise ingeneral level of prices. Although many policies have been applied throughout the history, the inflation is a problem which was and always will be inside the economy. High and perpetual inflation has a negative effect on society and economy. In an inflationary environment, many negative effects such as raise in production costs, investment decisions' becoming difficult, decrease in savings and emergence of foreign trade deficit come into existence. On the other hand, unemployment, which takes an important place in economy like the inflation, expresses the situation in which people cannot work because of various reasons. Beyond being an economic problem, unemployment can be described as a social problem as it creates moral and material negativities in social life. Since approximately 1970s, Turkey have been facing both unemployment and inflation problem. Both inflation and unemployment draw conclusions that can leave indelible effects on economy all by itself.*

In Turkey, both in the period when there was an import substitution oriented policy and after the January 24th decisions period when the foreign trade was liberalized, the policies related to inflation and unemployment couldn't be developed well. So, since the 1990s when outward-oriented industrialization strategies were applied, the inflation and unemployment have raised with the '94 Depression in Turkey, '97 Depression in Asia, '98 Depression in Russia, 2001 Economic Depression and 2008 Global Financial Depression. In order to provide stability, one of the important elements is to adopt an economic policy in which low rate inflation and less unemployment can be valid. There are many studies made in literature in order to define the relation between inflation and unemployment. The most important one among them is Phillips Curve and it defines the relation between inflation and unemployment in theory. According to this approach, the decrease in unemployment will result in the raise in inflation. However, although Turkey displayed a positive image in 2000s proving this theory, the question of "Are we going back to the days of stagflation?" flashes with its performance after 2010. Thus, the relation between variables are analyzed and the results are interpreted by using the inflation and unemployment data covering the period between 1990-2014 in order to present the relation between inflation and unemployment in Turkey, based on the importance of inflation and unemployment in economy.

***Keywords:** Inflation, Unemployment, Stagflation, Panel Co-integration.*
***Jel Classification:** E24, E31.*

1. Introduction

The inflation, which is defined as the perpetual raise of general level of prices, means the decrease in purchasing power of the currency at the same time. In other words, inflation defines the situation in which money income reaches a higher position when compared to actual output. That is, inflation is a situation that economic groups try to increase their real income or that they demand more monetary income to protect their level of income (Sönmez, 2007:7).

The concept of inflation which is considered as the most important economic problem for many developing countries appears before us as a subject that many countries have been trying to solve for many years. The inflation directly affects many economic subjects such as income level of a country, income distribution, process and effectiveness of the decision making of investors, level of employment, and the situation of payments and salaries of the employees. The emergence of inflation changes from country to country in terms of the country's own position. Preventing inflation is especially related to the identification of these reasons in a right way. Sometimes, the inflation emerges from the demand growth and sometimes it emerges from cost increase (Telek, 2012:1).

Turkey is a country which has been struggling with inflation for many years. The inflation was approximately 62,7 % in the period between 1983-1994. The inflation became 71,6% between the years 1995-2001. Among its reasons, there are the often emerging depressions and having a high rate in transition inflation rate among the sectors. As a result of struggle against the inflation programs applied during 2002-2012 and the Stand-by Agreement signed with IMF, the inflation became quite lower than the previous periods and it was 11,2% (Kılınç, 2013:74).

In macroeconomics, the unemployment is a problem which is as important as the inflation. The unemployment shows itself as a multi-directional problem which has both economic and social effects. According to the definition used by the Turkish Statistical Institution (TÜİK), the ones who have the following features are considered as unemployed: among the ones who have not been employed during the reference period (the ones who has never worked for profit allowance, as casual employee, or as paid or unpaid and has no connections with such works), all the people at the non-institutional working age who used at least one of the job search channels in the last three months and can start working in two weeks are included in the unemployed population. According to another definition, the unemployed is the existence of the labor force that has the power or demand to work and who consents to work for the current wage and cannot find a job (Yıldırım and Karaman, 2001:19). The unemployment comes before us as a both social and economic problem. Therefore, approaching it alone in economy policy and analyzing it makes it hard to solve this problem.

The population at the age of work (between 15 and 64) is separated into three sets as employed, unemployed and non-active population. The employed are the ones who work paid or unpaid during the reference period. The unemployed are the ones who do not have a job, who are ready to work and who were looking for a job actively before the survey made. The set out of these two sets is non-actives and they are excluded from the labor power (Brandolini, Cipollone, Vivione, 2006:9). As a result, the group out of the labor power includes seasonal workers, the people who do house works, students, the retired people and the people who cannot work.

There are many approaches explaining the reasons of unemployment. Besides the macro factors such as; globalization tendencies, technological improvements, level of production and investment, distribution of investment in the world, and population growth; there are primary environmental factors explaining the quality and the quantity of the unemployment such as lack of qualification, the educational policies that cannot meet the demands of business world, level of productivity, inability of public employment services, the corporate structure in labor power market, and increasing input prices (Duruel and Kara, 2009:358). The fundamental reasons such as the continuation of agricultural

society's qualifications and lack of providing with employment in galloping population lie at the bottom of the unemployment problem in Turkey. So, this gives birth to the result that the unemployment in Turkey has a structural feature. Primarily in industrial sector; not providing with regularity in the amount of investments results in not enough employment of the over labor power in agricultural sector by the sectors that are not in the agricultural sector. The weight of agriculture inside economy reduces related to the improvements in the process of industrialization and progress (Bozdağlıoğlu, 2008:46).

In Turkey, the first time job seekers generate approximately half of the long-term unemployed. Having a great share in long-term unemployment of the first time job seekers emphasizes the role of quality conflict in long-term unemployment (Gürsel and Ulusoy, 1999:130). The long-term unemployment rate is around 60% in European Union countries and especially in the continent of Europe. The long-term unemployment rate is quite lower in Turkey when compared to many European Union countries. Remaining too limited in scope of unemployment coverage in Turkey and the amount of the average income's being little explains why this rate is low. As the most of the unemployed cannot bear the cost of being a log-term unemployed, they tend to find a job quickly and this weakens the job seeking effectiveness of the unemployed (TÜSİAD, 2004:159).

So, in fact, Turkey had to struggle with inflation and unemployment for long years, in other words, Turkey dealt with the concept of "stagflation". As is known, stagflation defines the increase in unemployment while there is an increase in inflation, and this phenomenon confutes the Phillips Curve approach. Turkey was successful in ending -even if it is partially - the stagflation adventure that started in1970s and continued, in the first decade of 2000s. Although the expected improvement in unemployment problem wasn't provided, when the population growth in Turkey in referred period is considered, it is a fact that the rates are not in a desperate situation. However, besides unemployment, a huge part of the ground about inflation was covered and the economy was saved from the stagflation spiral due to the proportionately obtained decline in the light of the positive improvement in economy.

However, after 2010, when the high unemployment rate added the increase in inflation in itself, there emerged the question "Do Turkey have a problem of stagflation?" and along with this, the fear of economic instability emerged. When we look at the recent statistics, it is observed that the number of unemployed between the age of 15 and over in 2014 was 2,686,000 people in Turkey. However, the number of unemployed was 2,323,000 people on the books in the previous year. Consequently, the rate of unemployment reached the level of 9,9%. The unemployment rate in men was 8,4% and in women was 10,2%. At the same period, the unemployment out of agriculture was estimated as 10,8%. While the unemployment rate among the young which included the age range of 15 to 24 was 15,5%, this rate was 9,1% in the group of 15-64. And the number of employed was 26,194,000 people and the employment rate was 46,1%. This rate was 65,1% in men, and 27,6% in women on the books. According to the data obtained from Turkish Statistical Instıtution (TÜİK), inflation reached annually 9,32% on the basis of consumer price index, inflation reached annually 9,46% on the basis of domestic producer price index.

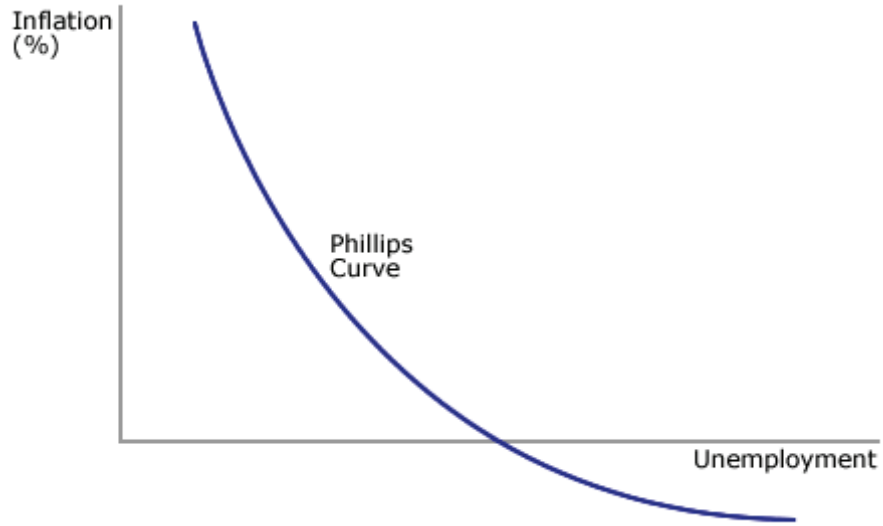
If there was a study on the most popular subject to be analyzed of the economists who have studies on economic policy in the last fifty years, it wouldn't surprise anyone to see Phillips Curve, which shows the concepts of inflation and unemployment and their relation, on the top of the list (Büyükakın, 2008:134). In time, different approaches about the direction and degree of the relation between inflation and unemployment dominated the ground. Based on this, the contribution of our study to the literature is to reveal results about the direction and dimensions of the relation between inflation and unemployment in Turkey with Time Series Analysis by using the data related to 1990-2014 period.

2. Theoretical Structure of Relationship Between Inflation and Unemployment

The first study on the relations between price change and unemployment & production level was published in Economic Journal with the title of “Stabilization Policy in a Closed Economy” by Alban William Phillips. Phillips includes the relation between the change rate in product prices and production level in this article. The relation between subject variables is explained in terms of derived demand which emerges in the factor markets and firstly affects factor prices and then product prices (Phillips, 1954:307-308). In his work which he formed by using annual data, Phillips took unemployment rate as independent variable and the rate of change in money wages as dependent variable. Instead of studying the period of 1861 – 1957 as a whole, he studied this relation by separating the period into three as 1861 – 1913, 1913 – 1948 and 1948 – 1957. A strong, inverse and non-linear relation between change rates inmoney wages and unemployment rates appeared in the first period covering 1861 – 1913. The relation in the period between 1913 and 1948 was not as strong as it had been in the first period. However, another important point to consider here is that the time period involves WWII and the period of recessions in itself. And in the last period which covers the years 1948 – 1957, this strong relation can be seen again (Altan, 1996:23-24).

As a result, in his work, Phillips revealed that there was a non-linear, inverse and steady relation between unemployment rate and change rates in money wages. In Figure 1, there is the original form of the Phillips Curve. The unemployment rate takes place in horizontal axis (u) and the change rate in money wages takes places in vertical axis (w).

Figure - 1: Original Phillips Curve



Source: Büyükakın, 2008: 137

Two fundamental features characterize the shape of it which secants the horizontal axis on a particular point and is non-linear. The first one is that while unemployment rate is in frictional level (5,5%), there is no change in money wages. The second one is that any value of unemployment rate equals to the two values of change rate in money wages. More clearly, any change rate emerging in money wagesin any level of unemployment will be faster when unemployment rate reduces and will be slower when unemployment rate increases (Phillips, 1958:290).

The first important effort to support Phillips Curvestrongly in theory, which was

revealed by A. W. Phillips empirically, was done by Richard G. Lipsey (1960). Lipsey tried to provide Phillips Curve with theoretical base via two hypothetical relations' combination here:

1) A positive linear relation between increase rate in money wages and demand surplus directed to effort.

2) A negative non-linear relation between the demand surplus directed to effort and unemployment.

Lipsey could provide with an economic justification for Phillips's non-linear negative relation between change rate in money wages and unemployment via the combination of these two hypothetical relations. As a result Lipsey expressed that the change rate in money wages depends on the degree of surplus demand (or supply) in labor market represented by level of unemployment (Lipsey, 1960:1-31; Snowdon and Vane, 2005:137-140).

The shape of Phillips Curve, which comes to the minds of the economists, was drawn by Paul Samuelson and Robert Solow two years after A. W. Phillips's study. The authors transformed the Phillips Curve which shows the relation between change rate in money wages and unemployment rate into a shape that shows the relation between inflation rate and unemployment rate (Samuelson and Solow, 1960:192).

In 1960s, the Phillips Curve was quickly accepted as a component part of Orthodox Keynesian Paradigm because Keynesian economists thought that the subject curve presented a selection menu between various unemployment levels and inflation rates and it represented the valid and stable relation for both short-term and long-term. According to the generally accepted interpretation of Phillips Curve in that era, permanently low unemployment levels could be realistically achieved through multiplying with permanently high inflation levels (Mankiw, 1990:1647).

Through the end of 1960s, Friedman (1968) and Phelps (1967), who brought a new perspective to the relation between inflation and unemployment brought by Phillips, indicated the importance of the inflation rate expectations against studies depending on past statics inflationist expectations and questioned if Phillips Curve protect their firmness feature by analyzing in the light of Monetarist theory. The greatest contribution of Friedman and Phelps to Phillips's analysis is that they brought "Expectation Augmented Phillips Curve". In the Expectation Augmented Phillips Curve approach, inflation rate expectation is taken into consideration as weighted average of delayed dynamic inflation rates. Friedman stated in his study that the hypothesis stating labor supply of Neo-Keynesian model was a function of nominal wage was invalid and supposed that labor supply was a function of expected real wage (Ünsal, 2004:359). It is indicated that the hypothesis stating that nominal variables have effect on real variables, which was produced by Friedman based on traditional Phillips curve, is illogical. In this regard, according to Friedman, Neo-Keynesian analysis' thesis supporting the idea that there is inverse exchange between unemployment and inflation rates is only valid for short term; in long term unemployment rate is completely independent from the inflation rate (Ünsal, 2004:36; Friedman, 1968:1-17). The second criticism towards Phillips Curve by Phelps and Friedman is related to the discourse stating that there is a stable relation between inflation and unemployment. Accordingly, an economy has a natural unemployment rate that is balancedin the long-term and via monetary policy, it is impossible to affect this long-term balance (Demir, 2005:8).

3. Related Literature

In economy literature, the relation between inflation and unemployment has been a subject of discussion for years. Today, most of the studies show that there is no long-term relation between inflation and unemployment; however, they show that there is a short-term relation between them (Akkı,uş, 2012:99). In this part, there will be a domestic and foreign literature review covering recent inflation-unemployment studies.

Monthly inflation and unemployment data were included in the analysis and it is determined that there is an inverse relation between the two in the period of 1935-1939 by Fisher, Nuizinga (1980) (Kılıç, 2013:94). Fountas, Lally and Wu got a result that revealed the relation reflected by short-term Phillips Curve in Ireland for the period of 1975-1992 in their study in which they searched the existence of the relation reflected by short-term Phillips Curve and long-term Phillips Curve in the economy of Ireland.

Eller and Gordon (2002) determined that there was an inverse relation between two variables by applying NAIRU (Noon Accelerating Inflation Rate of Unemployment) test in America with the quarter term data between the years 1995-2001. Uysal and Erdoğan (2003) discussed the relation between unemployment rates and price levels via Phillips Curve in their study covering 1980-2002 periods for Turkey. The authors divided this 23 years period into two as 1980-1990 and 1991-2002 and they suggested that there was a positive relation between unemployment and price levels between 1980 and 1990 and there was a negative relation between them in 1991-2002.

In the study applied by Önder (2004), in the short term analysis of the relation between inflation rate and unemployment rate output gap variable was used instead of unemployment rate. According to the result of the analysis, there was a significant exchange relation between inflation rate and output gap. In the study of Kuştepeli (2005) the relation between inflation rate and unemployment rate discussed as short-term analysis and a significant exchange relation between inflation and unemployment rate could not be found by using data sets belonging to different periods.

In the study covering the first term of 2000 and the third term of 2007 for the Turkish economy, Hepsağ (2009) found that the previous period inflation rates had effect on inflation rate in short term. Accordingly, it was stated that previous period inflation rate was the indicative of the current period inflation instead of short-term unemployment rates in price stability's attaining its goal. In the long term, a valid exchange relation between inflation rate and unemployment rate was found.

For South Africa, in the period between 1980 and 2008, Chicheke (2009) tested the correlation between inflation and unemployment by applying ADF unit root test and VEC model. According to the result of the analysis, there was an inverse relation between inflation and unemployment and it was come to the light that tight money policy had to be applied as a precaution.

Topçu (2010) analyzed the relation between unemployment and inflation on G8 countries. As a result of the analysis, it was found that there was duplex causation relation among G8 countries; that is, unemployment was the reason for inflation and inflation was the reason for unemployment.

By Berentsen, Menzio, Wright (2001) the relation between inflation and unemployment was analyzed by using inflation and unemployment adjusted data between the years 1970 and 1980. The result of the analysis showed that there was an inverse relation between these two variables. Mangır and Erdoğan (2012) studied economic relation between unemployment rate and inflation rate by using three-month values of unemployment and inflation rates of Turkish economy in the years between 1990 and 2011. As a result of the analysis, they found that Phillips Curve didn't support the theoretical hypothesis in short term in Turkey in the studied period.

4. Research Methodology

Before analyzing the causality relations between variables, the stability degree of the series must be defined. In the studies made with unstable time series, spurious regressions may occur. Although in spurious regressions there can be high R^2 and significant t statistics, the parameter estimations are economically meaningless. The usage of unstable time series can cause obtaining a relation which doesn't exist in reality between the variables in the model which will be estimated. So there isn't any economic significance of parameter estimation results in spurious regressions. In that case, the

stability of the time series to be used must be tested in the studies with time series analysis in order to avoid spurious regression (Ümit, 2007:160).

4.1. Unit Root Tests

$X_t = c_o + j.X_{t-1} + e_t$ (1)

In the equation (1), if $|j|<1$, X_t series is stable, if $|j|=1$, X_t series is not stable. It is favorable that the autoregressive coefficient j equals or is lower than one for most of the time series. If $j>1$, it is economically illogical. In the autoregressive equation with the number (1), $j=1$ is known as the "differences stable process" and most of the economic time series are seen as differences stable process. When $j=1$ in such a process, it is said that X_t series are integrated from the first degree (Utkulu, 1993:309). In the equation (1), the easy and proper method of integration degree of X_t was suggested by Dickey and Fuller (1987) and it is known as Dickey Fuller Test (DF). In short, this test tests $j=1$ against $j<1$hypothesis in (1).

From the equation (1), the following equation is estimated;

$\Delta X_t = c_1 + \lambda X_{t-1} + e_t$ (2)

The equation (2) can be explained as follows;

$X_t = c_o + (1+\lambda) X_{t-1} + e_t$(3)

$(1+\lambda)$ in the equation above is the same with j in the equation (1). If λ in equation (2) is negative, equation is $j<1$ as it is in (1). Therefore, DF test embodies the negativity test of λ in the equation (2) regression. Rejecting Ho hypothesis and accepting alternative ($\lambda=0$) hypothesis mean $j=1$ and it means that X_t is not stable in its level value. In that case, t and F distributions are not proper for the equation (2), the distribution of t statistics cannot be known for sure in this case.

Ho: $\lambda<0$ ($j<1$) =>Series are stable.

Ha: $\lambda=0$ (j=l) => Series are not stable.

If Ho hypothesis is rejected, there are two alternatives in this case; integration degree of X_t is bigger than 0 or there isn't integration in all of them. Naturally, the next step is to test if the integration degree equals one or not. DF equation becomes as follows:

$\Delta\Delta X_t = c_2 + \lambda \Delta X_{t-1} + e_t$ (4)

Our concern in the equation (4) is λ's negativity test. Until we set an integration degree for X_t or it is made stable by taking the differences of X_t series during this time, we can continue.

Although DF test is an important step in measuring integration degree, it doesn't take autocorrelation in error terms into consideration. If the error term e_t is with autocorrelation, DF (Dickey-Fuller) Test will be void. As a solution for this situation, Dickey and Fuller suggested adding dependent variable's delayed value to the model as explanatory variable and that way they suggested that autocorrelation be removed. This test is called Augmented Dickey-Fuller Test (ADF) and it is considered as the most effective test to identify integration degrees and it is widely used in practice.

ADF Test:

$$\Delta X_t = c_3 + \lambda X_{t-1} + \sum_{i=1}^{k} \lambda_1 \Delta X_{t-1} + u_t \quad (5)$$

is defined with the equation above. In ADF test, critical values table which is also used in DF test is used (Charemza and Deadmen, 1999:103-104).

4.2. Co-integration Methods

Co-integration is a technique which has been developed in order to analyze the correlation between two unstable time series. The concept of Co-integration was put forward by Engle and Granger (1987). Co-integration analyses are applied in order to analyze the long-term relations between series. In other words, the concept of co-integration is used in order to detect the long-term balance relations and to test it (Göktaş,

2005:113; Granger and Engle, 1987:251-276). The econometric usage of the word balance defines the long-term relations between unstable variables. In Engel and Granger's usage of the co-integration concept, there can be a reduced form relation among balance relations, causative, behavioral or trending variables. Engle and Granger (1987) defined co-integration as follows:

$x_1 = (x_{1t}, x_{2t}, x_{3t}, \cdots, x_{nt})$ vector's all components are defined as integrated on d and b[th] degree and it is shown as x_t ~ CI(d,b).

The Conditions

1) All the components of X_t are integrated on the d[th] degree.

2) There is the vector $\beta = (\beta_1, \beta_2, \cdots, \beta_n)$

3) $\beta x_t = \beta_1 x_{1t} + \beta_2 x_{2t} + \ldots + \beta_n x_{nt}$ is integrated on (d-b)[th] degree. (b>0) β vector is called as "co-integration vector" (Engle and Granger, 1987:253; Charemza and Deadman, 1999:144).

The importance of the integration degrees of series in co-integration concept is great. In order to learn if the series are co-integrated or not, the degrees of integration have to be known. The integration degrees of the series can be learnt through unit root tests. If a series is unstable with taking first difference, the series is stable on the level and because of that, it is I(0). In other words, "the integration degree of the series is zero". If the difference of the series must be taken d times in order to become stable, it is said that this series is integrated on the d[th] degree and it is shown as I(d). According to the definition, have two series which are X and Y I(1). In this case, naturally the linear combination of these two series will be I(1). However, under some circumstances, the linear combination of two I(1) variable can become a variable which is I(0). As defined, these series are called co-integrated series (Kadılar, 2000:119).

4.3. Engle-Granger Two-Phased Modeling Method

Granger suggests a causality analysis which is widely used in economy literature in order to show the direction of casuality between analyzed variables. Granger brought the concepts of casuality and exogeneity up. According to this, if adding the information belonging to X varibale to the model contributes to the forecast of the variable Y, the variable X is the cause of the variable Y. Granger causality analysis requires the estimationof regression set on delayed values of each internal variable's own and of other variables (Granger, 1969:553-560).

In this study, Granger Causality Analysis has been used in order to search the causality relation between CPI and unemployment. This analysis is made via using these two equation:

$$Y_t = \alpha_0 + \sum_{i=1}^{k1} \alpha_i Y_{t-i} + \sum_{i=1}^{k2} \beta_i X_{t-i} + u_t \quad (6)$$

$$X_t = X_0 + \sum_{i=1}^{k3} \chi_i X_{t-i} + \sum_{i=1}^{k4} \delta_i Y_{t-i} + v_t \quad (7)$$

Granger causality analysis is applied by testing if the coefficient of the delayed values of the independent variable, which is placed before error term in the model above, equals to zero as a group or not. If $\beta_i$coefficients in the equation (6) are found as different from zero in a particular significancy level, it is concluded that X is the cause of Y. Likewise, in the equation (7) $\delta_i$coefficients' being different from zero in a particular significancy level shows that Y is the cause of X. In that case, there is a mutual causality between X and Y. If the $\beta_i$coefficients are different from zero only in the eqaution (6), there is a one way causality relation from X to Y and if the $\delta_i$coefficients are different from zero

only in the equation (7), there is a one way causality from Y to X. If the β_i and δ_i are not different from zero, it is concluded that there is no causality relation between these two variables. In the original Granger Causality Analysis, k_1, k_2, k_3, k_4 show the delay lenght and u_t & v_t show the error term in the equations above (Işığıçok, 1994:93).

5. Results

In order to analyze course of events related to inflation and unemployment in Turkey, the relation between two variables have been studied by using an econometric modelling and in practice, the numerical results found by using time series have been interpreted. The logarithm of values has been taken in our study in order to avoid small fluctuations that time series can show. So, when it has been found that both variables haven't been stable in level, their first difference have been taken. Both of them became stable when their differences were taken. As Consumer Price Index (CPI) and unemployment were stable at the same level, Co-integration test was applied in order to determine if there was a long-term relation between them. And finally, Granger Causality Test was applied in order to see if the variables in the model are the reason of each other, in other words, in order to determine the direction of the relation between variables.

In the study, the data of 1990-2014 period annual CPI and unemployment were used and the subject data were obtained and compiled from the publications on the website of the Turkish Statistical Institute. For CPI data, "1987=100" index related to the period before 1995; and "1994=100" index related to the period from 1995 and after were used as base.

5.1. Panel Unit Root Analysis

Time series' being stable means that variance's and average's being stable in time and that covariance of variables in two delayed time period depended on the delay between variables, not on the time (Gujarati, 1995:709). When the stability analysis is observed, it is seen that both series are not stable on the level however when their first differences are taken, they become stable. The hypothesis belonging to CPI and unemployment are as follows:

Ho: Unit root included in CPI series
Ha: No unit root included in CPI series
Ho: Unit root included in Unemployment series
Ha: No unit root included in Unemployment series

Table – 1: Panel Unit Root Test Results

Variables	ADF (fixed)	ADF (Trend and fixed)	PP (fixed)	PP (Trend and fixed)
LNINF	-0.207920	-2.127666	-0.027499	-2.077122
LNUNE	-1.527232	-1.767737	-1.527232	-1.767737
ΔLNINF	-5.75851***	-5.87334***	-5.67759***	-5.85082***
ΔLNUNE	-3.97734***	-3.87996 **	-3.95107***	-3.848970**
Critical Value %1	-3.752946	-4.416345	-3.752946	-4.416345
Critical Value	-2.998064	-3.622033	-2.998064	-3.622033

Variables	ADF (fixed)	ADF (Trend and fixed)	PP (fixed)	PP (Trend and fixed)
%5				
Critical Value %10	-2.638752	-3.248592	-2.638752	-3.248592
Note: Δ figure shows the first differences. For ADF and PP, the critical values are obtained by MacKinnon(1996). ***p<.01, **p<.05, *p<.10				

If series doesn't include unit root, it means that it is not stable. When the fixed and fixed & trend data of ADF and PP test statistics are observed; these can be said for CPI and unemployment series: it is measured with ADF and PP tests that they don't have stable structure on the level and that they don't show a distribution around a certain average. When the results are studied, test statistics' being smaller than %1, %5 and %10 values as absolute value provides with the rejection of Ho hypothesis. When the first differences are taken, it is seen that the test statistics are bigger than critical values determined by MacKinnon as absolute values. So, when the first differences of CPI and unemployment rate series are taken, it can be said that they prove stability hypothesis.

5.2. Johansen Co-integration (VAR) Analysis

Because the series of the variables are stable at the same level with their first differences, Johansen Co-integration test is applied in order to prevent spurious regression relation. This test allows us to determine if there is a long-term relation between variables. The first step in Johansen method is to determine the length of the delay. In order to achieve that, many delays have been studied and it is decided that the optimum delay length is "one" according to AIC criteria. So in Co-integration test, this delay number was used and the found results are as follows:

Table – 2: Lag Length Test Results

Lag	LogL	LR	FPE	AIC	SC
0	-20.24408	NA	0.025902	0.022189	2.121374
1	9.29354	51.01953*	0.002550*	-0.299413*	-0.001856*
2	12.28630	4.625174	0.002830	-0.207846	0.288083

* Shows the delay number choosen according to the criteria.

In order to make the Co-integration Analysis which shows the long-term relation between variables statistically, the series need to be integrated from the same level I(d). As the first degree differences of both CPI and unemployment series in the application are stable, I(1), there is no problem in searching the Co-integration relation between them. Johansen Co-integration Test results, which were made for "one" delay length, are presented in the table 3:

Hypothesis:

Ho: CPI and unemployment series are not co-integrated.

Ha: CPI and unemployment series are co-integrated.

Table – 3: Panel Co-Integration Test Results

Ho Hypo.	Eigen Value Stat.	Trace Stat.	%5 Critical Value	Prob.*	Max Eigen Value Stat.	%5 Critical Value	Prob.*
r=0	0.33139	9.00367	15.4950	0.3650	8.85605	14.2650	0.2983
r≤1	0.00669	0.14762	3.8415	0.7008	0.14762	3.8415	0.7008

(.) Maximum Eigen value test shows that there is no co-integration equality in α=0,05.
***** P values are belongs to MacKinnon & Haug-Michelis (1999).

When the co-integration analysis results are observed, there is no significant co-integration between CPI and unemployment series. As the probability values of Eigen value and Trace statistics are bigger than alpha value which has the significance value, Ho hypothesis which expresses the lack of co-integration of series is not rejected. In the light of data set used between series, there isn't any Co-integration relation.

5.3. Granger Causality Analysis

"Granger Causality Test" was developed by Granger in order to test if one of the variables is the cause of the other in a modelling which is formed in order to estimate a variable. This test explains the causality relation between variables. The obtained results are presented in Table 4.

Hypothesis:

Ho: CPI is not the Granger cause of unemployment.
Ha: CPI is the Granger cause of unemployment.
Ho: Unemployment is not the Granger cause of CPI.
Ha: Unemployment is the Granger cause of CPI.

Table – 4: Granger Causality Test Results

Hypothesis	Observation No	F-Statistics	Probability
CPI is not the Granger cause of unemployment.	15	0.35154	0.5540
Unemployment is not the Granger cause of CPI.	15	7.41295	0.0136

According to the Granger Causality Test results, Ho hypothesis which claims that CPI is not the Granger cause of the unemployment is accepted (with 0.5540). Also, finally the Ho hypothesis claiming that Unemployment is not the Granger cause of CPI is rejected (with 0.0136). So, as a result of this practice made in order to determine the relation between variables and to determine if one of the variables is the cause of the other, it is found that there is a causality relation from unemployment rate to inflation rate.

Table – 5: Directions Of Causality Among Variables

Variables	Direction Of Causality	Relationship
Unemployment - CPI	→	One – Way Causality

When Granger Causality Test results given in Table – 4 were examined; it seems that statistically significant causality relationship is available for 2 directions without directions from Unemployment to Consumer Price Index (CPI) in the level of 0,05. Directions of causality among these three variables are shown in Table – 5 as a figure.

6. Conclusion

Inflation and unemployment are maybe the greatest two problems of economy. Because, as a result of these two phenomena, economic recession and most importantly decay in the social life can be seen. Besides, causing economic negativities such as reduction in production, decline in income and economic constriction, unemployment displays many negative effects on people in terms of psychology and society. Likewise, inflation brings about many negative events. Some of them are destroying income distribution, reduction in savings and investments, causing foreign trade deficit and destroying source distribution in the economy. Therefore, it is possible to say that inflation and unemployment cause serious wounds in both social sense and economic sense. Thus, governments should try to reduce inflation and unemployment and even reduce them to the minimum level with the various tools and policies that they apply. The relation between the concepts of this study has always been a matter of discussion. Looking at the literature, we can come across with various theoretical and empirical studies that have analyzed the relation between inflation and unemployment and obtaining different results.

In Turkey, the concept of stagflation, which contains the concepts of inflation and unemployment, emerged with the crisis periods of 1970s and it affected every part of the country. In order to solve the inflation and unemployment problems, many stability programs have been applied for many years.

In order to solve the subject problem, the aim of reducing inflation was clearly stated and inflation became the primary aim of many stability programs in 1980s. Although some achievement were realized during the period of 1980-2002 in the stability programs applied to struggle with inflation, no important success was achieved until 2003. However, as a result of passing to the strong economy and some structural programs applied after this period, inflation is slowly leaving its place of the most important problem of Turkey, today.

In the scope of struggle with inflation, Turkey left the implicit inflation targeting between 2002 and 2005 and has moved to open economy inflation targeting since 2006. With the effect of economic woes originating from European Union in 2008, even if it raised to 10,1% level in 2011, from 2012 on, inflation decreased to the level of 7,5%. However, when the political disturbance in 2013 brought about economic instability, according to the Turkish Statistics Institute (TÜİK)'s data, the annual rise in Consumer Price Index (CPI) happened in the rate of 9,32%. All these events show that in order to control the inflation in Turkey, fiscal policies should be used in addition to monetary policies to provide with fiscal discipline and that decisive attitude of the political authority in struggle with inflation has a great role in the struggle with the inflation.

However, although taking the precautions in order to prevent unemployment started with the planned period, it is hard to mention about a successful employment policy

in solving the problem unemployment. Unemployment is a problem of Turkey which is very old and structural. On the top of the reasons of this problem comes the population growth. Besides population growth, transfers from agriculture to non-agricultural sectors make this structural problem even heavier. The decline in employment paralleled with rise of fertility in agriculture during the progress process is a natural phenomenon paralleled with universal progress process. Constant economic crisis are also another reason that increase unemployment. When the change in unemployment after 2000 is observed, although there are not many changes in participating in labor force rate, it is seen that the unemployment rate has risen to 10,3% in 2002 from 6,5% in 2000. The main reason for this rapid rise is 2001 economic depression. Although in 2006, the effect of the crisis of 2001 in terms of unemployment started to reduce and unemployment partly regressed, it has been increasing since the second half of 2008 with the effect of the global economic crisis.

During this process, the unemployment rate, which set its record by increasing to 14% in 2009, managed to be on the book with the 8,9% by declining just like the inflation in 2012. However, while some confidence crisis that the government faced in 2013 in Turkey trimmed the unemployment rate to 10% by 2014 year-end, the point of view that the annual inflation rate won't be under 7% at best by the end of 2015, the stagflation risk is expected in Turkey with the increasing unemployment. When we think that FED decisions causes effects in Turkey as they do in any other developing countries, all these events will have negative effects on the economic growth of the country. Therefore, as an unavoidable condition in terms of economy, Turkey should maintain the political stability first and then should focus on the economic indicators in 2015, when the general elections are going to be held. Otherwise, the negative image on domestic and foreign investors who will directly or indirectly invest will realize in the recent period002C when the uncertainties grow, and the footprints of stagflation which has just started to be felt and which is only a riskfor now will become evident on Turkish economy.

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