ANALYSIS OF ECONOMIC GROWTH OF TURKEY: PAST AND PRE 2001 FINANCIAL CRISIS

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Keywords
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ABSTRACT

It has been seen that growth performance of Turkish economy has decreased in the last twenty-five years. Especially in the 1990s instability in macroeconomy increased with the impact of the developments in the financial market, crisis that began in financial market in 1994 and 2001 has led to the contraction of the real economy severely. However, 2001 financial crisis, resulting in unexpected economic contraction, is a milestone. Considering the indicators of 2001, the size of the contraction can be well understood, it is observed that concrete steps are taken towards the prevention and overcoming of the crisis deepening. The continuity ensured in the fiscal discipline, implementation of structural reforms and the tight monetary policy focused on price stability have had a positive impact on inflationary expectations of economic agents. Economy grew by an average 3.1% during the 1990-2001 period before the 2001 financial crisis; after then during the 2002-2006 period, economy has entered a rapid growth process and has grown average annual rate of 7.2%, and 3.3 % in the 2007-2012 period. In the 2002-2012 period private sector consumption and investment spending constituted the most important source of demand-side growth, in this period the rise of current account deficit due to increasing economic growth, failure to carry out a growth based on employment and increased productivity of the industrial sector which is provided with cheap labor are the drawback of this period. After 2007, the major cause of the decline in growth is global crisis. In this study, developments in growth as a result of the economic program implemented after the financial crisis of 2001 will be discussed. In this respect, in order to analyze the relationship between economic growth, unemployment rate, interest rate and investment by using variables of the 1990-2012 period, Chow test will be applied. In the analysis, the reason for using Chow test is whether there is any difference in economic terms between the policies implemented for economic growth in the 1990-2001 period and policies implemented in the 2002-2012 period after the financial crisis of 2001 as a result of the structural transformation.
1. INTRODUCTION

In Turkey, in the period of post-1990, as a result of crises experienced in the financial area, the decisions of April 5, 1990 were made: But without obtaining the targeted results, following the Asian and Russian crises, 1999 Marmara Earthquake negatively affected the economy and, in December 1999, a technical and financial standby agreement was signed with IMF. In the direction of this agreement, with the “Inflation Reducing Program” that was in active at the beginning of 2000, at the end of 2002, it was aimed to reduce inflation to the one-digit values; however, together with the crises of November 2000 and February 2001, it was concluded with unsuccessfulness. The financial crisis of February 2001 was not only concluded with a constriction, but also brought together the multidimensional new conditions changing the middle termed perspective of the country.

In 2001, in order to take under control the negative effects of large scaled capital outflow and decrease the fiscal cost of the crisis, providing the large scoped international financial support, “Program to Pass to the Powerful Economy” was applied. Before 2001 financial crisis, while economy was growing in the rare of average 3.1% in the period of 1990-2001, in the period of 2002-2006 entering a rapid growing process, it showed an average annual growth performance in the rate of 7.2%. Global Crisis that began in US before 2008 and then, that spread all over the world negatively affected Turkish economy as well and economy grew only in the rate of 3.3% in the period of 2007-2002. In the period of 2002-2012, while the most important resources of the demand sided growth consisted of the production and investment expenditures of private sector, in this period, the rise of current deficit, depending on the increase of economic growth; not being able to realize an employment based policy; and the fact that the productivity increase in the industrial sectors was provided with the cheap workforce are the negativities of this period. After 2007, the most important reason of the fall in the growth is the crisis experienced in the global life.

In this study, as a result of the economic program applied after 2001 financial crisis, some developments experienced during growth will be considered. In this direction, the relationship between the economic growth and the unemployment rate, investment, and interest rate, using the data of 1990-2012, Chow test will be applied to the variables. In the analysis, the reason for using Chow test, in the period of 1990-2001, between the policies applied toward the economic growth in the period of 1990-2001 and the policies implemented in the period of 2002-2012, as a result of a structural transformation after 2001 financial crisis, is to provide whether or not there is a difference from economic point of view.

2. THE GROWTH PERFORMANCE OF TURKEY IN THE PERIOD OF PRE-2001

Together with the foundation of Republic, the time lasting to 1960s are the years when Turkey attempted to form its industrialization strategy In this process, the result of that private sector cannot reach the sufficient capital accumulation, the government, directly entering the market as a producer, took place in both the production of the basic consumer goods and in the areas, where the private sector
cannot enter, and that require large scaled intensive capital (Doğruel and Doğruel, 1996: 4).

In this period, Turkish economy, despite 1929 Depression and the negative conditions the Second World War, caught a growth rate between 5.1% and 3.2% (Ay and Karaçor, 2006:69).

Together with 1990s, it was passed to the period of planned development, whose main purpose is to increase the national income, via industrialization. The most important feature of this period, in the environment, where the country is closed to the external competition, with the active public interventions, is to adopt the import substitution industrialization policy. In this period, while the resources of economic growth are the capital accumulation, technological development, and increase in the labor force in terms of supply, they are expansion of the internal market in terms of demand. In 1960s, while per capita GDP was increasing by 5.4%, it increased in the rate of 4.1% in 1970s (Çeçen, Doğruel and Doğruel, 1996: 4). However, the oil crises experienced after 1970s, the lowness of interest rates, high customs tariffs, quotas and prohibition toward import, and overvalued exchange rates, caused the international terms of trade of the country to be disturbed. In this period, it was seen that the import substitution based policies could be economically substituted and the decisions of January 24, 1980 were made (Karaçor, Erdoğan and Er 2013:737).

Along with the decisions of January 24, 1980, leaving the import substitution industrialization policy, in which the import applied was substituted with the domestic production, it was passed to export based industrialization strategy and the foundations of free market economy were laid (Karaçor,2012:115). Opening the economy to the foreign competition, going toward the infrastructural investments, and liberalization of financial markets are the major steps taken on the name of market economy In the period of 1981-1990, the economy grew in the rate of average 5%. In this growth, the expand trade, export incentive as well as the expansion of the internal and external demand, capital accumulation, and productivity increase had been effective (Ay and Karaçor, 2006:70).

However, Gulf Crisis, experienced in 1990, and 1991 local elections led to getting loose in the monetary policy; at the end of the year 1993, the policies toward reducing the interests to be disordered the balance of interest –exchange rate; and thus, economy to get into crisis (Buluş,2009:103). In the period of 1995 -1999, following the crisis, even though the devaluation of TL in the rate of 60%, and stability precautions of April 5, 1994 applied revealed short termed positive results in the economy, going away from the fiscal discipline in this period, as a consequence of that the growth and public financing become vulnerable to the exogenous shocks, of the crisis experienced in Asia in 1997, and then in Russia, and the earthquake disaster experienced in our country in August 1999, laggings were experienced in the import, export, and economic growth.
### Table 1: Main Economic Indicators (1990-2001)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate (%)</td>
<td>9.4</td>
<td>0.3</td>
<td>6.4</td>
<td>8.1</td>
<td>-6.1</td>
<td>8.0</td>
<td>7.1</td>
<td>8.3</td>
<td>3.9</td>
<td>-6.1</td>
<td>6.3</td>
<td>-9.5</td>
</tr>
<tr>
<td>Inflation rate (%)</td>
<td>60.30</td>
<td>65.90</td>
<td>70.10</td>
<td>66.10</td>
<td>106.26</td>
<td>89.11</td>
<td>80.35</td>
<td>85.73</td>
<td>84.64</td>
<td>64.87</td>
<td>54.92</td>
<td>54.40</td>
</tr>
<tr>
<td>Unemployment rate (%)</td>
<td>8.0</td>
<td>8.2</td>
<td>8.5</td>
<td>9.0</td>
<td>8.6</td>
<td>7.6</td>
<td>6.6</td>
<td>6.8</td>
<td>6.9</td>
<td>7.7</td>
<td>6.5</td>
<td>8.4</td>
</tr>
<tr>
<td>Current account deficit / GDP (%)</td>
<td>1.3</td>
<td>0.1</td>
<td>0.5</td>
<td>2.7</td>
<td>3.6</td>
<td>1.0</td>
<td>1.0</td>
<td>1.4</td>
<td>0.7</td>
<td>0.4</td>
<td>3.7</td>
<td>4.9</td>
</tr>
<tr>
<td>Public sector borrowing requirement /GDP (%)</td>
<td>7.8</td>
<td>10.1</td>
<td>10.2</td>
<td>12.0</td>
<td>8.0</td>
<td>4.1</td>
<td>8.2</td>
<td>7.9</td>
<td>9.7</td>
<td>15.8</td>
<td>12.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Foreign trade deficit (Million $)</td>
<td>9.34</td>
<td>7.45</td>
<td>8.15</td>
<td>14.0</td>
<td>5.164</td>
<td>14.0</td>
<td>20.4</td>
<td>22.2</td>
<td>18.9</td>
<td>14.0</td>
<td>26.72</td>
<td>10.06</td>
</tr>
</tbody>
</table>

*Source: Undersecretariat of Treasury, Ministry of Finance, Central Bank*

At the end of 1990s, as a result of the factors mentioned above, Turkish economy faced to the crises of November 2000 and February 2001.

### 3. THE GROWTH PERFORMANCE OF TURKEY IN THE POST-2001 PERIOD

The crises that occurred in November 2000 and February 2000, caused, on the one hand, TL to devalue, the internal demand to decrease, the high inflation, the problem of public internal debt, and the vulnerability of banking sector, on the other hand, the collapse of inflation reducing program, based on the exchange rate anchor applied in our economy.

The standby agreement, signed in May 2001 with IMF, and “Program to Pass to Powerful Economy”, supported by the credits of World Bank, were implemented (Celasun,2002:17 ) The objective of this program is “to rapidly eliminate … the thrust depression and instability, and to form the infrastructure toward restructuring the public administration and economy in irrevocable way” (Undersecretariat of Treasury, 2001:5).

### Table 2: Main Economic Indicators (2002-2013)

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate (%)</td>
<td>6.2</td>
<td>5.3</td>
<td>9.4</td>
<td>8.4</td>
<td>6.9</td>
<td>4.7</td>
<td>0.7</td>
<td>-4.8</td>
<td>9.2</td>
<td>8.8</td>
<td>2.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Inflation rate (%)</td>
<td>29.7</td>
<td>18.4</td>
<td>9.3</td>
<td>7.7</td>
<td>9.7</td>
<td>8.4</td>
<td>10.1</td>
<td>6.5</td>
<td>6.4</td>
<td>6.47</td>
<td>8.9</td>
<td>7.4</td>
</tr>
<tr>
<td>Unemployment rate (%)</td>
<td>10.3</td>
<td>10.5</td>
<td>10.8</td>
<td>10.6</td>
<td>10.2</td>
<td>10.3</td>
<td>11.0</td>
<td>14.0</td>
<td>11.9</td>
<td>9.8</td>
<td>9.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Current account deficit / GDP (%)</td>
<td>0.3</td>
<td>2.5</td>
<td>3.7</td>
<td>4.6</td>
<td>6.1</td>
<td>5.9</td>
<td>5.4</td>
<td>2.0</td>
<td>6.2</td>
<td>9.7</td>
<td>6.2</td>
<td>7.1</td>
</tr>
<tr>
<td>Budget deficit / GDP</td>
<td>11.5</td>
<td>8.8</td>
<td>5.2</td>
<td>1.1</td>
<td>0.6</td>
<td>1.6</td>
<td>1.8</td>
<td>5.5</td>
<td>3.6</td>
<td>1.4</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Foreign trade deficit (Billion $)</td>
<td>15.5</td>
<td>22.1</td>
<td>34.4</td>
<td>43.3</td>
<td>54.0</td>
<td>62.8</td>
<td>69.9</td>
<td>38.8</td>
<td>71.7</td>
<td>105.9</td>
<td>84.1</td>
<td>98.0</td>
</tr>
</tbody>
</table>

(*)Official realization prediction

*Source: Undersecretariat of Treasury, Economics Report, 2013*

As a result of the program implemented after 2001, the macroeconomic developments experienced until the end of 2001 were in the positive direction; the global crisis rising in USA before 2008 and spreading all over the world also negatively affected
the Turkish economy. These developments can be briefly summarized as follows (Taban, 2011:6-7):

- When we regard to the price movements, in respect with the year 2002, CPI (Consumer Price Index) inflation regressed to 9.3% in 2004, and 7.7% in 2005. The inflation rate that actualized in the rate of 9.7% in 2004 actualized as 8.4% in 2007, following the 2008 global crisis, became 10.1%, 6.5% in 2009, 8.9% in 2012, and 7.5% in 2013.
- In the period of 2002-2007, two negative developments, experienced in the Turkish economy, are that the unemployment cannot be reduced, despite the high growth; and deficit in current balance. The unemployment rate that was 10.3% in 2002 actualized in the rate of 10.2 in 2006, 11% in 2008, 11.9% in 2011, and 9.4% in 2002. From the aspect of current deficit, the rate of current deficit to the GDP that was 0.3% in 2002 actualized as 5.9% in 5.9% in 2007, and as 6.2% in the years of 2010 and 2011.
- The efficiency and increase of savings was provided in the budget; thanks to the higher performance in the tax values, the positive developments were experienced in the budgetary revenues. The share of budgetary deficit in GDP that was 11.5% in 2002 regressed to 1.6%; rose to 3.6% in 2010, and in 2012, regressed to 2.1% in 202.

Following the shrinkage of 5.7% that actualized in 2001, Turkish economy reach the high rates of growth until 2008. In the period of 2002-2007, the highest growth rate actualized in 2004 with 9.4%. The rate of economic growth that actualized in the years of 2005, 2066, and 2007 were 8.4%, 6.9%, and 4.7%, respectively. Following 2008 global crisis, Turkish economy constricted in the rate of 4.8% in 2009, and then, recovering itself, grew in the rate of 9.2% in 2010, 8.8% in 2011, and 2.2% in 2012. In short, in the period of 2002-2012, the annual average rate of growth actualized 5.2%.

To regard to the demand directional resources of growth (Ministry of Finance, Annual Economic Reports);

- Total consumption expenditures, especially personal consumption expenditures, hold the largest share in the spending items. The share of personal consumption expenditures in GDP, 66.7% in 2002, was around 70% in 2007. In 2008, from the aspect of expenditures, the component of GDP having the largest share was the personal consumption expenditures with 68.9%. This situation shows how large the contribution of private sector to the GDP growth is. After 2008, global crisis, the reduction of private sector its expenditures in 2009, in response to this, the increase of public sector counterbalanced the economy. In 2010, while the consumption expenditures of private sector actualized in the rate of 69.2%, increasing, the consumption expenditures of public sector was 10.7%.
- Following the consumption expenditures, fixed capital investments hold the largest share in GDP. Fixed capital investments, growing in the average rate of 16.8 in the period of 2002-2007, made an important contribution to the
high rate growth. However, fixed capital investments, becoming smaller by 5% in 2008, actualized in the rate of 20%. In 2010, while investment expenditures of private sector were 19.2%, investment expenditures of public sector were 4.1%.

- The share of public expenditures in GDP changed a little. In the period of 2002-2007, it was about average 10% in 10%.
- While the shares of stock variations in GDP were 1.4% and 1%, in the years of 2002 and 2003 respectively, in the period of 2004-2007, it actualized negatively. In 2008, the decrease in export made largely effect on the level of stocks and the share of stock variables actualized in the rate of 0.4%. Stocks, in 2010, leaving their roles in the period of crisis and post-crisis, returned to their normal levels, made a contribution to the growth throughout the year in the rate of 2.4%

As will be understood from the relationships above, in Turkey, in the period of 2002-2011, the driving force of growth are the consumption and investment expenditures of private sector. However, in 2012, this situation, changing a little, net export became driving force.

The supply orientated resources of growth consist of the agriculture, industry, building, and service sectors.

Table 3: Sector Shares in GDP and Annual Increase Rate of Growth (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Growth</td>
<td>Share</td>
<td>Growth</td>
</tr>
<tr>
<td>2002</td>
<td>8.8</td>
<td>12.2</td>
<td>2.7</td>
</tr>
<tr>
<td>2003</td>
<td>-2.0</td>
<td>11.4</td>
<td>7.8</td>
</tr>
<tr>
<td>2004</td>
<td>2.8</td>
<td>10.7</td>
<td>14.1</td>
</tr>
<tr>
<td>2005</td>
<td>7.2</td>
<td>10.6</td>
<td>8.6</td>
</tr>
<tr>
<td>2006</td>
<td>1.4</td>
<td>10.0</td>
<td>8.3</td>
</tr>
<tr>
<td>2007</td>
<td>-6.7</td>
<td>8.9</td>
<td>5.8</td>
</tr>
<tr>
<td>2008</td>
<td>3.5</td>
<td>9.2</td>
<td>1.1</td>
</tr>
<tr>
<td>2009</td>
<td>3.5</td>
<td>10.1</td>
<td>-6.7</td>
</tr>
<tr>
<td>2010</td>
<td>2.4</td>
<td>9.5</td>
<td>12.6</td>
</tr>
<tr>
<td>2011</td>
<td>2011</td>
<td>5.3</td>
<td>7.5</td>
</tr>
</tbody>
</table>


In Turkey, the period of 2002-2012, the supply directional resources of the country are considered in the context of the agriculture, industry, and service sectors. When we regard to the sectorial structure of GDP of the period of 2002-2007, service sector held the largest share with 55%. The global crisis experienced in 2008 negatively affected the industrial and service sectors in terms of production. As will be seen from the table as well, in 2008 and 2009, the serious falls were experienced in the growth rates of sectors. In spite of this, the agricultural sector grew by 3.5% in the same year together with the improvement in the agricultural sector. In 2010, the growth was experienced in all sectors. The sector, in which the growth rate is the lowest, due
to the fact that the seasonal conditions passed severe, is the agricultural sector. As a conclusion of the transformation the Turkish economy experienced in the last ten years, the share of agriculture in economy increasingly declines. One of the most important items of the potent economic recovery experienced in 2010 was the industrial sector with the growth rate of 12%.

In 2012, due to slowing in the industrial and service sectors, the contribution of these sectors to the growth are observed to decrease. In the second quarter of 2002, the contribution of the service, industrial, and agricultural sectors to the growth was 1.6%, 1.0, and 0.3%.

4. LITERATURE SURVEY

In this study, as a result of economic program, applied after 2001 financial crisis, the developments experienced in the growth will be considered. In the literature, most of studies carried out consider theoretically how the post-crisis policies applied affected the growth in a theoretical framework.

Celasun (2002) conducted a macroeconomic evaluation of those experienced in the pre and post – crisis. In this process, the similar and different aspects of especially 1991 and 1994 crises were attempted to be determined. The common feature of both crises is that there was a large amount of capital input in the pre-crisis year, and in the crisis year, that a large scaled capital outflow was concluded with the shrinkage of economy. In the most bottom part of its different aspects, 2001 Crisis arose in the process of implementing IMF program.

Turan (2005) considered the crises of November 2000 and February 2001. He argued that the crises experienced in the recent years, on the one hand, led to the price instability; on the other hand, caused the trouble of equity capital for growth; increased the deficits of payments balance; and as a consequence of this, that our need for resources increased. For all of these troubles to be able to be eliminated, those requiring to be done are forming the new and contemporary entities, materializing the structural reforms to provide the economic efficiency; and providing a sustainable growth rate etc.

Ay and Karacor (2006), in the post-2001 period, making a discussion on the transition from the crisis to the growth in the Turkish economy, investigated whether or not the growth numerals in the recent period of Turkey are virtually hormonal. The questions they search for their answers in this discussion are what the sources of the growth in the high rate are; whether or not the growth is sustainable; and how a good growth should be. The answers of these questions are toward that the growth is not sustainable and that there is no a good growth. For overcoming these questions, it is necessary to decisively continue the structural reforms; provide the political stability; and not go toward the populist applications.

BDDK (2010), in the study titled “Turkish Experience from Crisis to Stability”, investigated the effect of the crises November 2000 and February 2001 on the banking sector. As a result of crises experienced, due to the immediate changes in the expectations and decisiveness of all investors, domestic and foreign, high amount of
capital outflow occurred. Crisis 2000 – 2001 revealed that an economy having a structural problems in financial sector would not be able to sustain the regime of fixed exchange rate. The important lessons were learnt from these crises and reflection of these lessons is seen in the banking act, numbered of 5411, and its applications.

Ozeren (2012) considered the development experienced in the economic growth and employment after crisis. According to the findings obtained from the study, in the period of 30 years, the main determinative of the growth in Turkish economy is capital accumulation. From the view point of providing a sustainable growth, it is necessary to reduce the dependency of economy on the foreign resource.

5. METHODOLOGY

In this study, the effect of the economic program implemented after the financial crisis of 2001 on economic growth, using the values of period 1990-2012, was analyzed via Chow test.

In the analysis, two separate periods was considered; 1990-2001 and 2002-2012. Economic data on the variables of economic growth, unemployment rate, investment rate and interest rate were drawn from database of Central Bank of Republic of Turkey and Turkey Statistical Institute. As dependent variable, Gross domestic product (gdp) was received, while independent variable, interest rate (R), gross fixed investment rate (I) and unemployment rate. In carrying out the analyses, Eviews 7.0 package program was used.

Chow test tests the equality of equality of regression equations on the different periods with the same variables. To be able to carry out Chow test, in a certain period of a variable in time, a structural change should be under consideration. The stags of making Chow test are as follows (Yılanoğlu, 2008):

**First stage**: establishment of model for the entire period

\[ Y_G = \beta_0 + \beta_1 X_{1G} + \beta_2 X_{2G} + \ldots + \beta_k X_{kG} + \epsilon_G \]

**Second stage**: establishment of model for the period before break

\[ Y_1 = \beta_0 + \beta_1 X_{11} + \beta_2 X_{21} + \ldots + \beta_k X_{k1} + \epsilon_1 \]

**Third stage**: establishment of model for the period after break

\[ Y_2 = \beta_0 + \beta_1 X_{12} + \beta_2 X_{22} + \ldots + \beta_k X_{k2} + \epsilon_2 \]

**Fourth stage**: hypothesis

Ho: regression coefficients are not different from the economic point of view.

Hı: regression coefficients are different from the economic point of view.
**Fifth stage:** Calculation of F test statistic

\[
F_{hes} = \frac{\left[ \sum_{i=1}^{N} e_i^2 - \sum_{g=1}^{G} e_g^2 \right] / k}{\sum_{g=1}^{G} e_g^2 / (N - Gk)}
\]

G: Number of regression equation

\[\sum_{i=1}^{N} e_i^2\] = residual sum of squares of all observations

\[\sum_{g=1}^{G} e_g^2 = \sum e_1^2 + \sum e_2^2 + \ldots + \sum e_G^2\] : residual sum of squares for G units regression equation

**Sixth stage:** Decision

If \( F_{hes} > F_{tab} \), Ho hypothesis is rejected and it is reached the conclusion that regression coefficients are different economically from the period to period.

### 6. EMPIRICAL FINDINGS

Economic model created and the variables of this model are as follows:

\[
GDP = \beta_0 G + \beta_1 RG + \beta_2 IG + \beta_3 UG + \epsilon
\]

GDP: Gross Domestic Product

R: Interest Rate

I: Gross Fixed Investment Rate

U: Unemployment Rate

Econometric tests were conducted at 5% significance level.

**First stage:** the creation of the regression equation for the period 1990-2012

**Table 4: Results of First Stage**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>-0.013272</td>
<td>-1.664584</td>
<td>0.1124</td>
</tr>
<tr>
<td>I</td>
<td>0.296975</td>
<td>9.824078</td>
<td>0.0000</td>
</tr>
<tr>
<td>U</td>
<td>-0.405540</td>
<td>-1.486794</td>
<td>0.1535</td>
</tr>
<tr>
<td>C</td>
<td>6.764683</td>
<td>2.396499</td>
<td>0.0270</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.872376</td>
<td>Sum squared resid</td>
<td>90.18387</td>
</tr>
</tbody>
</table>
GDP = 6.764683 - 0.013272 R + 0.296975 I - 0.405540 U
(2.39)            (-1.66)              (9.82)        (-1.48)

The values shown in parentheses are t statistics.

\[ \sum e_G^2 = 90.18387 \]

**Second stage:** the creation of the regression equation for The period before the 2001 financial crisis (1990-2001)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>-0.007157</td>
<td>-0.670266</td>
<td>0.5216</td>
</tr>
<tr>
<td>I</td>
<td>0.347697</td>
<td>7.336538</td>
<td>0.0001</td>
</tr>
<tr>
<td>U</td>
<td>-0.707314</td>
<td>-0.768810</td>
<td>0.4641</td>
</tr>
<tr>
<td>C</td>
<td>8.104933</td>
<td>1.163800</td>
<td>0.2780</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.903415</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GDP = 8.104933 - 0.007157 R + 0.347697 I - 0.707314 U
(1.16)          (-0.67)            (7.33)          (-0.76)

The values shown in parentheses are t statistics.

\[ \sum e_1^2 = 47.25797 \]

**Third stage:** the creation of the regression equation for after the 2001 financial crisis (2001-2012)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.045590</td>
<td>2.015690</td>
<td>0.0837</td>
</tr>
<tr>
<td>I</td>
<td>0.230449</td>
<td>9.844155</td>
<td>0.0000</td>
</tr>
<tr>
<td>U</td>
<td>-0.886509</td>
<td>-2.917852</td>
<td>0.0224</td>
</tr>
<tr>
<td>C</td>
<td>11.64553</td>
<td>3.339268</td>
<td>0.0124</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.951876</td>
<td></td>
<td>9.154884</td>
</tr>
</tbody>
</table>

GDP = 11.64553 + 0.045590 R + 0.230449 I - 0.886509 U
(3.33)          (2.01)              (9.84)          (-2.91)

The values shown in parentheses are t statistics.

\[ \sum e_2^2 = 9.154884 \]
Fourth stage: hypothesis

\[ \text{H}_0: \text{The 2001 crisis is not effective on economic growth.} \]

\[ \text{H}_1: \text{The 2001 crisis is effective on economic growth.} \]

Fifth stage: Calculation of F test statistic

\[
F = \frac{(90.18387 - (47.25797 + 9.154884))/4}{(47.25797 + 9.154884)/22 - 8} = \frac{8.442754}{4.029489} = 2.095
\]

Sixth stage: Decision

\[ F_{\text{hes}} = 2.095 \quad F_t = 1.64 \quad F_{\text{hes}} > F_t \]

Ho hypothesis is rejected and it is reached the conclusion that regression coefficients are different and vary from the period to period. That is, the 2001 crisis have been effective on economic growth in a positive or negative way.

7. CONCLUSION

Turkish economy, as a result of contractionary monetary policy applied after Crisis 2001, entered a stable growth process until 2008 Global Crisis and in the period of 2002-2007, it grew in the rate of average 7%. In the period before global crisis, the most important demand directional resource of GDP increase is the service and industrial sector. Following 2008 Global Crisis, the important falls were experienced in the growth rate and as in the period of 2008 – 2012, while the most important resource of growth is personal consumption and investment expenditures in term of demand, it is the service and industrial sector in terms of supply.

In this study, how the structural breakage analyses of two regression expression will be applied was demonstrated with an application on the economic growth in Turkish economy. As an econometric method, Chow structural breakage test was chosen. According to the results of Chow test, 2001 Crisis became effective on the economic growth of Turkey. However, Chow analysis does not give any result about whether the activity is positive or negative. It reveals that only the periods of 1990-2001 and 2001-2012 engendered effects different from each other on the economic growth.

REFERENCES


BDDK 2010. Krizden İstikrara Türkiye Tecrübesi, Çalışma Tebliği


