THE RELATIONSHIP BETWEEN INCOME DISTRIBUTION AND DEVELOPMENT: THE CASE OF TURKEY[1]

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ABSTRACT

This study aims to determine whether income inequality in Turkey is an obstacle in economic development or not. For this purpose, the gini coefficient are used as a measure income inequality and real GDP is used as an economic growth indicator between the years of 1990-2015. Johansen co-integration method is utilized in the analysis of the study. Co-integration analysis has shown a long-term relationship between the gini coefficient and economic growth. In order to determine the direction of causality, the error correction model is applied. The findings indicate that the direction of causality runs from economic growth to gini coefficient. This result shows that economic growth is an important factor in the reduction of income inequality. Empirical result reveals also that the reduction of income inequality through economic growth is the crucial factor for Turkey's economic development.

Keywords: Income distribution, economic development, income inequality, economic growth, Turkey.

JEL Codes: *O4, O15, C22*

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1. INTRODUCTION

Providing equality in income distribution is one of the important concerns of most countries in the world. Income inequality has negative impacts on economic development and growth. It is generally accepted that income inequality has adverse effects on investments and this situation would negatively affect the development efforts of developing countries. Distirbuances in the distribution of income would decrease expenditures such as feeding, education and health. This leads to reduce labor productivity and ultimately results in low level of economic development and growth.

Although there is numerous studies which examine the inequality-growth relationship in different countries, the empirical evidences in those studies are heavily complicated. For instance, Partridge (1997), Li and Zou (1998), Forbes (2000) founded positive relationship between the inequality and growth. In contrast, Perotti (1993), Alesina and Rodrik (1994), Persson and Tabellini (1994), Clarke (1995), Alesina and Perotti (1996), Ahituv and Moav (2003), Josten (2004), Davis (2007), Coll (2014) studies affirmed a negative relationship. There were also some studies which did not found any correlation between the inequality and the growth. Lee and Roemer (1998), Panizza (2002) and Castello and Domenech (2002) studies are some of them.

This study aims to determine whether income inequality in Turkey is a serious problem in the economic development or not. In this respect, the paper is organized as follows: Following the introduction, section 2 briefly discusses the theoretical literature. Section 3 informs data and variables used in the study. Section 3 presents econometric methodology and the results. Section 4 summarizes the paper's findings.

2. THEORETICAL LITERATURE

The theory which explains the relationship between income distribution and development was first developed by Kuznets (1955). According to Kuznets, as percapita income rises, income distribution would firstly become more unequal and then less unequal. This situation was defined as Kuznets' inverted U-shaped hypothesis. Following Kuznets, Robinson (1976) developed Kuznets hypothesis and added employment mobility to that model. In this model, agriculture sector was seen as the leading sector and income inequality was relatively lower compared to the other sectors. The main reason behind this was the lower income of workers. On the other hand, because of the fact that percapita income level is higher in industry and urban regions, income inequlality is encountered frequently in these regions. In the first stage of development, employment mobility from agriculture to industry increases the income inequality. However, during the development migration from agriculture to industry decreases the underemployment in agriculture and marjinal productivity of workers would probably increase. In addition, workers' incomes would also increase in agriculture sector and also workers' positisons and their incomes in industrial sector would develope. In other words, with the increasing the incomes of the employees, the convergence situation would probably be reflected in revenues.

Barro and Sala-i Martin (1997) who are among the endogenous growth theorists explained the puplic spendings which have significant role in the decreasing inequality of the income distribution. In this context, when we consider the wealth effects of puplic spendings such as education, health and social security, it is easily said to have improvement impacts on the income distribution of public spendings.

Increasing demand in the redistrubiton income is another approach on the relation between income distribution and development. According to this approach, the inequality in

income distribution decreases per capita income and thus it increases redistribution demand. Increasing demand in redistribution income would probably bring social-political instability and the investments would be affected negatively with the threating the property rights (Alesina ve Perotti, 1996). In addition, the inequality in income would lead economical units to increase rent activies and this situation would heavily negative impacts on capital accumulation and development.

The informal economy also affects the development via income distribution. For instance, high informal sector would result in decrease in tax revenues and social security spendings would be decreased. Reducing these kind of spendings would have a role on raising income inequality. Furthermore, decreasing tax incomes of informal economy also would decrease puplic spendings and this situation would limit household's income. This also would be a problem for development.

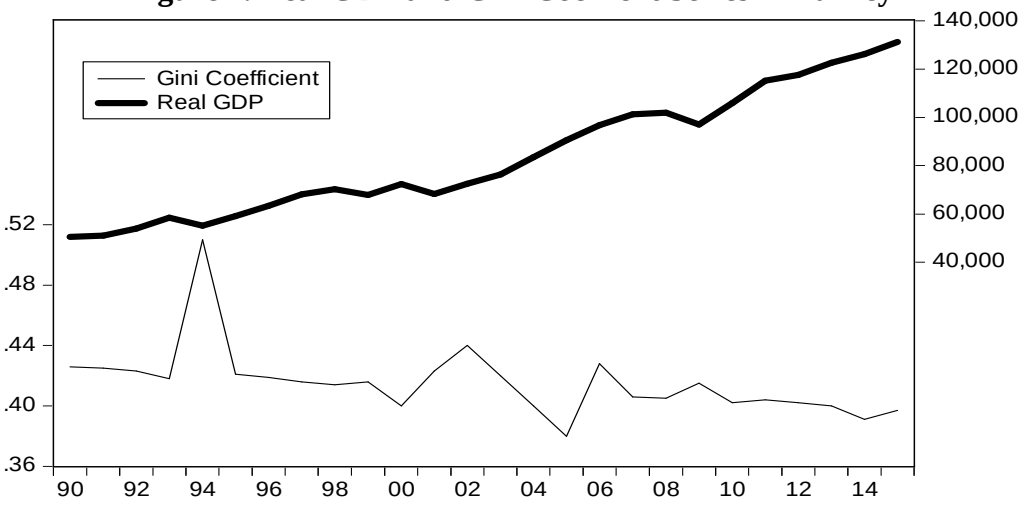
In recent years, another study which discusses and critizes the some points of the Kuznets' hypothesis is the work of Nobel economist Piketty tittled as 'Capital in the 21st Century'. This study differs from the other studies which provides the discussions held on the inequality based on historical process. During the period of 1914-1945, the disturbances of inequality declined seriously in almost all rich countries. Due to this reason, Piketty put forward the impacts caused by the World wars which had severe economical and political shocks not only the mobility between social groups as depicted by Kuznets. Piketty emphasizes that Kuznets' data is limited for investigated period, and it is required to collect the tax records for analyzing the structure of income inequality (Piketty, 2014:16).

3. DATA AND VARIABLES

Annual data for the period of 1990-2015 are used in this study. Real GDP (1998=100) is assessed as an indicator of economic development and gini coeffients are defined as a measure for income inequality. Real GDP data are collected from the Turkish Statistical Institution (TUIK) during the period of 1990-2015. Gini coeffients (GINI) between 2002-2015 acquired from TUIK, the other variables between 1990 and 2001 obtained from Dumlu ve Aydın (2008). We also use dummy variables (D1994 and D2009) which are statistically significant in the models. All variables are measured in the natural logarithmic form, namely LGDP and LGINI stands for logarithms of real GDP and gini coefficient.

Figure 1 depicts real GDP and gini coeffient series in Turkey during the period 1990-2015.

Figure 1. Real GDP and Gini Coeffient Series in Turkey



4. ECONOMETRIC METHODOLOGY AND RESULTS

We utilize the Johansen (1998) co-integration and error correction model in order to test the relations between income distribution and real GDP. Just like in othe time series data, the variables GDP and GINI coeffients must be tested for stationary before running cointegration. We use the Augmented Dickey Fuller (ADF) stationary test to examine the order of integration of the series.

ADF unit root test results obtained from above equations are reported in Table 1.

Table 1. ADF Unit Root Test Results

Variable	Level / First Difference	Intercept	Intercep and Trend	None	Result
LGDP	Level	0.862 (0)	-1.832 (0)	4.233 (0)	I (1)
	First Difference	-4.582*(0)	-4.725*(0)	-2.912*(0)	
LGINI	Level	-2.425 (4)	-3.116 (4)	-0.434 (1)	I (1)
	First Difference	-7.599*(0)	-7.431*(0)	-7.750*(0)	

Note: The numbers inside brackets denote the appropriate lag lengths. The lag for the ADF test is based on Schwarz Information Criterion.
* significant at the 1% level.

Unit root test resuts show that both variables are non-stationary at level. Having found that the variables are non-stationary at level, the next step is to differentiate the variable once. As seen from the table, once the variables are differentiated, both the variables are affirmed to be stationary according to the ADF unit root test results. Since the variables, namely I (1), are integrated in the same order the series can be tested for the existence of a co-integration relationship between them.

Before co-integration analysis, the number of lags is important for the model to be determined. Because of the fact that the results of the model often depend on the numbers of lags included, appropriate lag lengts have been determined as 1. In this lag lenght, we have seen that the model has respectable diagnostic test results at the 5% level.

Table 2. Diagnostic Test Results for Residuals

Autocorrelation LM (1)	White Heteroskedasticity (Chi-sq)	Normality (Jarque-Bera)
0.602 (0.963)	17.166 (0.512)	8.294 (0.081)

Note: The numbers inside brackets denote p values.

In co-integration method, whether there is a long term relationship between variables or not is determined through trace and max-eigen statistics.

The results of Johansen Cointegration test are displayed in Table 3.

Table 3. Johansen Cointegration Test Results

Series: LGDP-LGINI Exogenous Variables: D1994 D2009				
Hypothesis	Max-Eigen Statistic	Critical Value 5%	Trace Statistic	Critical Value 5%
H_0: r = 0*	27.444	14.265	29.646	15.495
H_0: r ≤ 1	2.203	3.841	2.203	3.841

Note: * denotes the rejection of H_0 hypothesis at the 5% significant level.

As seen in Tablo 3, the results indicates that according to both max-eigen and trace statistics, hypothesis is rejected at the 5% significant level. In other words, cointegration analysis has shown a long term relationship between the gini coeffients and economic growth.

Having found that long term relationship between variables, we need to determine the causality relation between them. In order to define the direction of causality, the vector error correction model (VECM) is applied.

VECM model is adapted into our model as follows:

$$\Delta LGDP_t = \beta_0 + \beta_1 \Delta \text{LGDP}_{t-1} + \beta_2 \Delta \text{LGINI}_{t-1} + \beta_3 ECM_{t-1} + \beta_4 D1994 + \beta_5 2009 + \varepsilon_t$$

$$\Delta LGINI = +\alpha_0 + \alpha_1 \Delta \text{LGINI}_{t-1} + \alpha_2 \Delta \text{LGDP}_{t-1} + \alpha_3 ECM_{t-1} + \alpha_4 D1994 + \alpha_5 2009 + \varepsilon_t$$

where ECM_{t-1} shows the error correction term lagged one period in above equations.

There is an adequate evidence for causality if t statistic value of error correction term is negative and statistically significant in the models. Table 4 indicates that t value of error correction term is appeared to be a negative and significant at 1% level in the model which is dependent variable GINI. Findings indicate that the direction of causality runs from economic growth to gini coefficient. This result shows that economic growth is an important factor in

reduction of income inequality. On the other hand, no relationship has been found statistically running from gini coefficient to economic growth according to ECM_{t-1} and F statistics results.

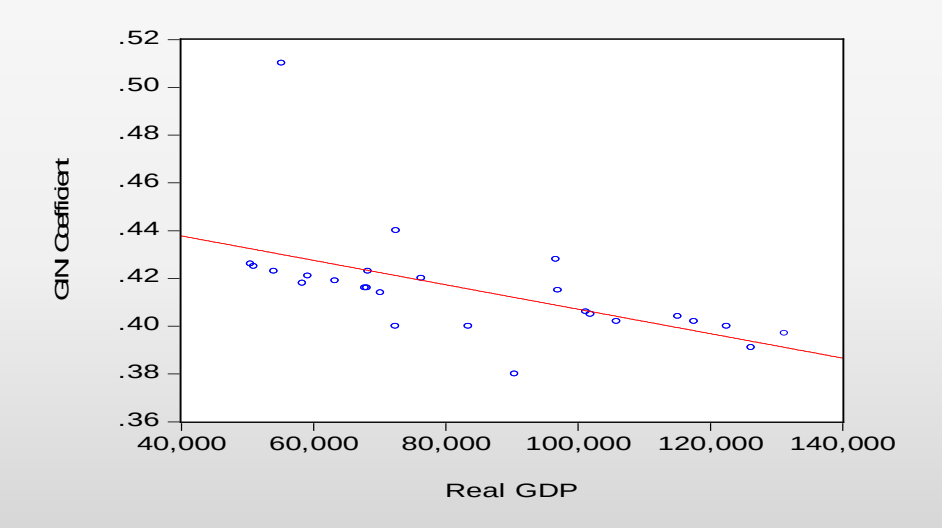
Table 4. Causality Test Results Based on Vector Error Correction Model

Dependent Variable	ECM_{t-1}	F statistics	Result
ΔLGINI	-1.1172 (-6.0825)*	0.2527 (0.6221)	GDP → GINI
ΔLGDP	0.0031 (0.1960)	0.0138 (0.9080)	No Causality

Note: The numbers inside brackets denote the t statistics values.
* Significant at the 1% level..

The direction of causality relation between real GDP and GINI has been indicated via scatter diagram. As can be seen from Figure 2, the relation between them is negative and corelation coeffient (-0,54) also verifies this relation. In other words, economic growth improves the income distribution.

Figure 2. Scatter Diagram of the Relationship Between Real GDP and Gini Coefficient.



5. CONCLUSION

This study aims to determine whether income inequality in Turkey is an obstacle in economic development or not. For this purpose by using annual data for the period 1990-2015 Johansen cointegration approach has been implemented. Cointegration analysis has shown a long-term relationship between the gini coefficient and economic growth in Turkey. In order to define the direction of causality, the vector error correction model is applied. Findings indicate that the direction of causality runs from economic growth to gini coefficient. These results show that economic growth is an important factor in the reduction of income inequality. Empirical results also explain that the reduction of income inequality through economic growth is an opportunity for Turkey's economic development. In this respect, government's social transfer spendings increased between 1990-2015 period. This situation has contributed to the social and culturel improvement of the household and has become supporting factor for the national growth. Decreasing gini coeffient has also limited the

material deprivation rate with the economic growth in Turkey. For instance, the material deprivation rate was 60,4% in 2006 and this ratio decreased to 30,3% in 2015 (TUIK, 21.09.2016).

In addition, social transfer expenditures have positive effects on the income equality. The ratio of these kind of expenditures in GDP was %5,5 in 1990 and currently it has approached to 13%. Overall, it can be stated that social transfer expenditures support the economic development through social and culturel improvement of household.

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