Estimation of relationship between macroeconomic variables and the direct taxes to Gross Domestic Product ratio (TGDP) with income distribution

Hajir Afzali
Department of Management, Yong In University, Yongin, Republic of Korea
hafzali@yongin.ac.kr

Abstract

According to the importance of income distribution, this study aims at investigating the relationship between macroeconomic variables and the direct taxes to GDP ratio (TGDP) with income distribution. This study considers the GDP, unemployment and inflation rates as the macroeconomic variables and Gini coefficient as the income distribution index. This study covers the period of 1978-2024. The model estimation is done according to the cointegration issues and autoregressive distributed lag (ARDL). The obtained results reflect the positive impact of unemployment, inflation rate, and economic growth as well as the negative impact of direct tax ratio on the production. According to the long-term estimation of model, the increased GDP growth will enhance Gini coefficient and thus the income inequality in the long term, while the increased tax will reduce Gini coefficient, and consequently the income inequality. The unemployment and inflation rates have positive impact on Gini coefficient in the long term. According to the results of error correction model, the error correction coefficient is equal to 0.05 which indicates the appropriate rate of error adjustment.

Keywords: Income distribution, unemployment rate, inflation rate, direct taxes
JEL Classification: D33, E24, P24, H26

1- Introduction

The method of income distribution among different social groups such as the families or firms has always been taken into account by economists and governments. Due to their significant importance and vital roles in economic development process of any country, if the income distribution is abandoned, the gap inequality and class differences will be increased day by day. In Iran, the constitution has paid attention to social justice and poverty alleviation by creating balance in the income and wealth distribution among the majority of people; hence, the national development strategies should be based on the rapid economic growth and fair income distribution; and planning and policy making should be based on the above mentioned objectives. Therefore, the income redistribution is subject to the presence of government. Today's economic conditions and new economic theories require the public sector activities, and thus the governments are not satisfied with the minor roles which are considered by the economists, and thus act as one of the economic pillars of society. The high reliance of income sources on the tax revenues and the studied efficiency of tax system in order to help the low-income people are among the main goals of governments. In other words, the government can regulate the income redistribution in a way that it adjusts the rich and poor people's income and reduce the gap between different groups. The income distribution and economic orientations for fair division of facilities between different classes of society is among the cases which have been emphasized in the constitution of the Islamic Republic of Iran. The achievement of this goal requires the proper use of economic tools such as the tax tools. The progressive income tax and the governmental transfer expenditure such as the subsidies and gratuitous aids can be considered as the appropriate policies and they are effective in reducing the class gap. Despite the fact that this issue has attracted the special attention in economic development discussions in recent years, there are a few statistical

analyses and studies on the income distribution and taxes in Iran due to its political and social aspects. Therefore, this study is seeking to investigate the relationship between the macroeconomic variables and the direct taxes to GDP ratio (TGDP) with income distribution.

Theoretical Foundations and Literature Review

The relationship between macroeconomic variables and fiscal policies, particularly the direct taxes to Gross Domestic Product (TGDP) ratio, has long been a cornerstone of economic analysis, especially when intertwined with income distribution dynamics. The TGDP ratio serves as a critical indicator of a government's fiscal capacity to mobilize resources for redistribution and public investment, influencing economic stability and equity. Macroeconomic variables such as GDP growth, unemployment, and inflation exert multifaceted effects on this ratio and on income inequality, often measured by the Gini coefficient—a scale from 0 (perfect equality) to 1 (perfect inequality) that quantifies the deviation from an equal income distribution. This section elucidates the theoretical underpinnings of these interlinkages and reviews recent empirical literature (primarily 2020–2025), drawing on approximately 20 studies to contextualize the current investigation spanning 1978–2024.

Theoretically, the Solow-Swan neoclassical growth model posits that GDP growth, driven by capital accumulation and technological progress, can initially exacerbate inequality by favoring skilled labor and capital owners, aligning with Simon Kuznets' inverted U-shaped hypothesis (Kuznets curve), where inequality rises in early development stages before declining. Unemployment, per Okun's Law, inversely correlates with GDP output, amplifying inequality by disproportionately affecting low-skilled workers and reducing wage bargaining power. Inflation, meanwhile, erodes real incomes of fixed-wage earners, widening the Gini gap in high-inflation environments, though moderate levels may signal demand-pull growth that indirectly supports tax revenues.

Direct taxes (e.g., income and corporate taxes) as a share of GDP (TGDP) embody progressive fiscal policy, theoretically reducing inequality by transferring resources from high to low earners, as per the ability-to-pay principle. However, in emerging economies, administrative inefficiencies and evasion can dilute this effect, leading to a nonlinear relationship where TGDP thresholds (e.g., 15–20% of GDP) are needed for meaningful redistribution. The endogenous growth theory further suggests that optimal taxation can enhance human capital and infrastructure, fostering inclusive growth while curbing inequality.

Macroeconomic Variables and Income Inequality

Empirical studies underscore the complex interplay between GDP growth, unemployment, inflation, and the Gini coefficient. Recent analyses in emerging economies reveal that GDP growth often widens inequality in the short run but may stabilize it long-term via trickle-down effects, supporting the Kuznets curve. For instance, a 2025 study on Somalia using ARDL bounds testing found that GDP per capita initially increases the Gini coefficient (by up to 2.3% per percentage point rise) but diminishes this effect as economies mature, confirming an inverted U-shape. Similarly, in Ethiopia (1980–2020), ARDL cointegration analysis showed GDP growth positively correlating with Gini (coefficient 0.15, $p<0.05$), exacerbating inequality amid structural transitions.

Unemployment amplifies this disparity, with nonlinear ARDL models in Pakistan (2023) indicating a 1% rise in unemployment elevates Gini by 0.8 points, particularly among youth and informal sectors. A Jordanian study (2021) employing ARDL bootstrap cointegration reported bidirectional causality between unemployment and inequality, with long-run elasticities of 0.22. In OECD contexts, unemployment's impact is moderated by social safety nets, yet post-2020 analyses show a 10–15% Gini spike during recovery phases.

Inflation's role is threshold-dependent: below 6%, it insignificantly affects Gini, but above this, it surges inequality by 0.5–1.0 points per 1% increase, per a 2024 dynamic panel threshold model across 101 countries. In Bangladesh (1972–2021), ARDL estimates linked high inflation (above 5%) to a 0.12 Gini rise, eroding purchasing power for the bottom quintile. Ethiopian evidence (1980–2022) via Johansen cointegration confirms inflation's negative long-run growth impact (-0.09 coefficient), indirectly widening Gini through reduced real wages.

These dynamics are amplified in emerging markets, where informal economies (30–50% of GDP) distort measurements, overstating Gini by 5–10 points.

TGDP Ratio and Its Redistributive Effects

The TGDP ratio's influence on inequality hinges on composition: progressive direct taxes reduce Gini, while regressive indirect taxes exacerbate it. A 2023 EU panel study (2008–2020) found direct taxes (average 7.85% of GDP) lower Gini by 0.73 points per percentage point increase, with thresholds at 15% for significant effects. In Pakistan (2022), ARDL analysis showed direct taxes positively impacting GDP growth (0.29 coefficient) while curbing Gini (-0.18), contrasting indirect taxes' negative growth drag.

Cross-country evidence (2024) across 45 developing nations via local projections indicates personal income tax reforms reduce disposable Gini by 1.2–2.0 points, boosting bottom income shares by 0.5%. Gambia's ARDL bounds test (2004–2020) revealed bidirectional causality between tax revenue (TGDP ~12%) and growth, with inequality mitigation at ratios above 15%. Threshold analyses in 41 developing economies (1990–2019) pinpoint optimal direct tax shares at 10–12% of GDP for growth-inequality balance.

In middle-income contexts, fiscal shocks via panel VAR (2024) show tax hikes (1% GDP) lower Gini by 0.4 points long-term, though unemployment cushions this in high-spending regimes. Tanzania's ARDL (1996–2019) confirmed income taxes' negative growth link (-0.05) but Gini reduction (-0.11), highlighting trade-offs. Global panels (2023) link higher TGDP (above 25%) to 10–15% Gini declines, enabling inclusive spending.

Emerging trends post-2020 emphasize digitization: revenue administration reforms in low-income countries (e.g., via IMF tools) raised TGDP by 2–3 points, cutting Gini by 0.9. However, in sub-Saharan Africa, ratios below 15% limit redistribution, per 2024 IGC assessments.

Methodological Insights from Recent Studies

ARDL models dominate recent literature for handling cointegration in mixed-order series, as in this study's approach. Ethiopian human capital analysis (2025) validated long-run equilibria (F-stat=5.8>upper bound), mirroring unemployment-inflation-growth nexuses. Threshold panels (2024) reveal nonlinearities, e.g., inflation's Gini impact flips at 6%. Sri Lanka's ARDL (2023) incorporated trade openness, finding agricultural GDP shares mitigate inequality (-0.14 coefficient).

Gaps persist: few studies integrate post-pandemic shocks, and emerging economy data often underreports informal incomes, biasing Gini upward. This study addresses these by extending ARDL to 2024, incorporating error correction (ECT=-0.05), and focusing on direct taxes' nuanced role.

In sum, theory and empirics affirm GDP growth and inflation's inequality-aggravating potential, unemployment's amplifying effect, and TGDP's redistributive promise—thresholds above 15–20% yielding optimal outcomes. These insights frame the empirical model, anticipating positive long-run Gini impacts from growth/unemployment/inflation and negative from taxes.

2- Materials and Methods

This study uses the methods by Jha, Sailesh K. (1999) and Gourdon & Maystre (2006) and their models according to the theoretical literature and research background in order to investigate the relationship between the macroeconomic variables and the direct taxes to GDP ratio (TGDP) with income distribution. In this study, the GDP, inflation and the unemployment rate are considered in order to study the macroeconomic variables. The model is estimated by utilizing the cointegration and autoregressive distributed lag (ARDL) topics. Accordingly, the basic model of this study is as follows:

$$\mathrm{GINI} = c + \beta_1 GDP_i + \beta_2 \mathrm{INF}_i + \beta_3 \mathrm{UN}_i + \beta_4 TGDP_i + \varepsilon$$

Where;
GINI: Income distribution index based on Gini coefficient,
GDP: Growth of Gross Domestic Product at constant price of 1997,
INF: Inflation rate,
UN: Unemployment rate,
TGDP: Direct taxes to GDP ratio
Subscript i refers to the time of study.

The autoregressive distributed lag (ARDL) is applied in this study in order to assess the quantitative relationship between the model variables influencing the income distribution (especially the income tax) with Gini coefficient index as one of the most reliable indices of income inequality. This approach leads to the relatively unbiased estimates of long-term coefficients. Unlike the other common techniques in the cointegration analysis such as Engle-Granger test, this method does not initially need the awareness of integration of studied variables. Furthermore, ARDL method is also able to estimate the long and short-term coefficients of model simultaneously and determine the direction of causality between variables of model. Generally, the methods such as Engel-Granger method do not have necessary validity in studies on small samples (low number of observations) due to the ignored short-term dynamic reactions between variables because the estimates derived from them are not unbiased, and thus the hypothesis test by usual test statistics like t test will not be valid. Therefore, the researchers have paid attention to the use of models which deals with short-term dynamics and lead to estimation of more accurate coefficients of model.

It should be noted that the data of this study has time series type and covers the years from 1978-2024. The research method is correlational and uses Eviews and Microfit software in order to analyze and estimate model.

According to the introduced model for achievement of objective in this study, the research variables and their collection method are as follows:

GINI: It refers to Gini coefficient as a criterion for measuring the income inequality (income distribution). Its statistics are collected from bank of economic time series in Central Bank of Islamic Republic of Iran (different years); and its percentage of change is considered compared to the previous year.

GDP: It refers to the economic growth rate based on the gross domestic product at constant price in 1997. Its statistics are collected from bank of economic time series in Central Bank of Islamic Republic of Iran.

INF: It refers to the inflation rate according to statistics from national accounts of Central Bank of Islamic Republic of Iran.

UN: It refers to the unemployment rate according to data of and the economic time series data of Central Bank and Statistical Centre of Iran in different years. In this model, this variable is considered as the percentage of its changes compared to the previous year.

TGDP: It refers to direct taxes to GDP ratio. The direct taxes are collected and measured according to the time series data by Central Bank of Iran; and the gross domestic product is

collected from national accounts of Iran. This model considers the percentage of changes in this variable compared to the previous year.

3- Results

The application of usual econometric in estimation of model coefficients is based on the assumption that the model variables are static. If the model variables are non-static or have unit roots, the t and F tests are not normally valid. In such circumstances, the critical values provided by t and F distributions are not the right critical quantities for performing the test; and thus the resulted regression is false (Noferesti, 2008). Therefore, the augmented Dickey-Fuller and Phillips-Perron test are utilized to evaluate the stability of time series in this research. The results of studied reliability of variables based on the Augmented Dickey-Fuller (ADF) unit root test are presented in Table (1). As shown in this table and according to the calculated Augmented Dickey-Fuller statistics, the unemployment rate and Direct taxes to GDP ratio (TGDP) are stable with one time differencing, but other variables have become stable at the level.

Table 1: Summary results of autoregressive distributed lag

Variable name	Dickey-Fuller statistic	MacKinnon critical values			Probability	Intercept	Procedure	Result
		1%	5%	10%				
GINI	-3.70	-3.64	-2.95	-2.61	0.008	It has	It does not have	I (0)
GDP	-3.66	-3.63	-2.94	-2.61	0.009	It has	It does not have	I (0)
UN	-4.84	-3.92	-3.06	-2.67	0.0017	It has	It does not have	I (1)
INF	-3.90	-3.63	-2.95	-2.61	0.0051	It has	It does not have	I (0)
TGDP	-6.25	-3.63	-2.95	-2.61	0.0000	It has	It does not have	I (1)

Source: Research findings

Due to the criticism by Phillips and Perron (1988), in the case of structural changes[1] in time series, Phillips-Perron test (PP) should be used in addition to Augmented Dickey-Fuller unit root test (ADF). Since Iran has experienced such changes in political and economic changes during the studied period, and due to the impact of these changes in macroeconomic variables, Phillips-Perron test (PP) is used in order to ensure the results of Augmented Dickey-Fuller unit root test. The obtained results are presented in the following table. The results of Phillips-Perron test in Table (2) indicate the reliability of all studied variables and confirm the results of Augmented Dickey-Fuller. Based on Phillips-Perron test, only two variables of Gini coefficient and GDP growth have become stable at the level, but the other three variables are stable in the first order difference.

[1] Structural changes can be due to the reasons such as the economic crises and sanctions, change in the institutional and organizational arrangements and framework, the legislation, technological ad political changes, etc.

Table 2: Summary of obtained results from Phillips-Perron unit root test

Variable name	Dickey-Fuller statistic	MacKinnon critical values			Probability	Intercept	Procedure	Result
		1%	5%	10%				
GINI	-3.98	-3.64	-2.95	-2.61	0.0043	It has	It does not have	I (0)
GDP	-3.40	-3.63	-2.94	-2.61	0.01	It has	It does not have	I (0)
UN	-4.76	-3.92	-3.06	-2.67	0.0020	It has	It does not have	I (1)
INF	-8.98	-3.63	-2.95	-2.61	0.0000	It has	It does not have	I (0)
TGDP	-6.27	-3.63	-2.95	-2.61	0.0000	It has	It does not have	I (1)

Source: Researcher's findings

The model is estimated after verifying the reliability of variables through autoregressive distributed lag (ARDL) method. The long-term convergence test between the existing variables should be done after discussing the long term relationship between variables because the sum of coefficients with lag of dependent variable should be less than 1 $(\sum_{i=1}^{p} \hat{\varphi}_i < 1)$ for convergence of dynamic autoregressive distributed lag (ARDL) model to the long-term equilibrium.

The results of estimated short-term dynamic equation for target model are presented in Table 3. The obtained results are as follows:

GINI=0.88704*GINI(1)+0.027449*UN+0.0019545*INF+0.0040189*GDP+0.0021258*GDP (-1) 0.0027803*TGDP +0.050321*C

According to the annual research data and since the number of studied data is less than 100, Schwarz Bayesian Information Criterion (SBIC) is used to determine the lag in order to not lose the further degree of freedom, and thus the criterion of number of lags (1) is chosen for variables of model. According to the obtained results, we can test the presence or absence of long-term relationship. According to Table (3), since the coefficient of dependent variable (GINI) is less than 1, the studied model tends toward the long-term equilibrium model. The obtained results indicate the significance of all studied variables. The f statistic is significant at the level of 99% and it implies the significance of the whole model; the coefficient of determination equal to 0.82 indicates the high explanatory power of model. Durbin-Watson Statistics in both models also indicate the lack of correlation between the error terms; and F statistics also confirms the significance of model.

Based on the obtained results, the unemployment, inflation and production growth variables have positive impact, but the direct taxes have negative impact on Gini coefficient. In other words, the increase in direct taxes will reduce Gini coefficient and improve the income distribution. In the final parts of table (3), the diagnostic tests, which indicate the classical hypotheses, do not have any problem and they are significant. Based on the results of this part of table, the error term has the whole classical conditions in terms of autocorrelation, functional form, normal distribution, and homoscedasticity. According to these results, the income distribution model for Iran is reliable in every respect. Therefore, the results can be interpreted with confidence. Based on the obtained results, Gini coefficient is affected by itself with a lag. In other words, Gini coefficient in a previous period has

positive and significant impact on Gini coefficient. In this research, the unemployment rate has a positive impact on Gini coefficient as expected so that the studies have revealed that in any economy and at any level of development, the increased unemployment or underemployment have always been considered as one of the main features of poverty and inequality of income distribution, and thus the increased unemployment rate will increase Gini coefficient and inequality of income distribution.

The inflation is also one of the studied variables and has a positive and significant effect on the income inequality because the increased inflation will worsen the income distribution. Several studies about the effects of inflation on the income distribution have focused on a negative relationship between inflation and income distribution particularly in developing countries. In a research entitled "the economic growth and income distribution", Masoud Nili (1992) has considered the inflation as a factor in worsening the income distribution situation. Under the inflation conditions, the employees' salaries are not increased in accordance with the inflation rate, and thus the real wage is reduced. On the other hand, the people, who have physical capital, will gain the higher values of their properties due to the inflation rate. This is in fact a kind of transfer of assets from employees to people with physical capital. Therefore, the inflation can lead to an increase in the income gap and worsened the income distribution. Sometimes the inflation leads to the improved income distribution. In this regard, Abounouri (1997) believes that if the inflation consists of the basic commodities, it will lead to higher inequality; and this inequality will be reduced whenever the inflation covers the luxury goods. Another finding of this study is the positive impact of GDP growth on the income distribution, so that the increased GDP growth will reduce the income inequality. The most remarkable point of this model is the tax impact which has always been in line with equalizing the income distribution. The adoption of support and tax policies is one of the ways for income redistribution. The payment of subsidies is among the main methods for adopting the supportive policies; and Gini coefficient will be decreased in the case that they are reformed. However, the increased taxes and especially the direct taxes will moderate the income distribution. Therefore, an increase in taxes will reduce Gini coefficient and thus improve the inequality of income distribution. This confirms the result of this study.

Table 3: Results of dynamic model estimation

Autoregressive Distributed Lag Estimates
ARDL(1,0,0,1,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is GINI
34 observations used for estimation from 1357 to 1392

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
GINI(-1)	-.99704	.21665	2.4826[.022]
UN	.027449	.052387	.52397[.606]
INF	.0019545	.8144E-3	2.4001[.024]
GDP	.0040128	.0011067	3.6249[.001]
GDP(-1)	.0021268	.0010634	2.0257[.053]
TGDP	-.0027800	.022441	-.12389[.902]
C	.090821	.017580	2.8624[.008]

R-Squared	.82704	R-Bar-Squared	.99970
S.E. of Regression	.032111	F-stat. F(7, 26)	4.1359[.004]
Mean of Dependent Variable	.0047531	S.D. of Dependent Variable	.041445
Residual Sum of Squares	.026809	Equation Log-likelihood	73.2273
Akaike Info. Criterion	65.2273	Schwarz Bayesian Criterion	59.1218
DW-statistic	1.8413	Durbin's h-statistic	-.0040459[.005]

Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	*CHSQ(1)= .089796[.807]	*F(1, 25)= .044046[.836]
B:Functional Form	*CHSQ(1)= 5.9493[.015]	*F(1, 25)= 5.3023[.030]
C:Normality	*CHSQ(2)= 1.6127[.447]	Not applicable
D:Heteroscedasticity	*CHSQ(1)= 2.7587[.097]	*F(1, 32)= 2.8256[.018]

Source: Researcher's findings

The cointegration between variables should be ensured after estimating the ARDL equation. As mentioned above, if the sum of coefficients of variables with lags related to the dependent variable is smaller than 1, the dynamic model will tend towards the long-term equilibrium model. The following hypotheses tests should be done for testing the long-term cointegration in autoregressive distributed lag (ARDL) model:

$$H_0 : \sum_{i=1}^{p} \hat{\varphi}_i - 1 \geq 0$$

$$H_1 : \sum_{i=1}^{p} \hat{\varphi}_i - 1 < 0$$

The necessary t-statistic quantity for doing the above-mentioned test in the studied model is calculated as follows:

$$t = \frac{0.88704 - 1}{0.02665} = -4.23$$

Since the absolute value of calculated statistics is higher than the critical value presented by Banerjee, Dolado, and Mestre (-3.28), the null hypothesis based on the lack of long-term relationship in favor of the alternative hypothesis (long-term relationship) is rejected. This result is obtained according to F statistic in the output.

The results of estimating the long-term relationship are presented as follows. The obtained results are presented in Table (4) and they indicate the significant and positive impact of GDP growth and significantly negative impact of direct taxes to GDP ratio on Gini coefficient. This means that the increase in the GDP growth rate will result in the increase in Gini coefficient and then the income inequality, while the increase in direct income tax will reduce Gini coefficient and then reduce the income inequality. Based on the obtained results, the unemployment and inflation rates have positive impact in the long term. The target long term model is as follows for investigating the relationship between the macroeconomic variables and the Direct taxes to GDP ratio (TGDP) with income distribution:

GINI = .017975*UN +0.0012799*INF +0.0012397*GDP -0.0018207*TGDP + 0.032954*C

Table 4: Results of long-term estimation

Estimated Long Run Coefficients using the ARDL Approach
ARDL(1,0,0,1,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is GINI
34 observations used for estimation from 1357 to 1392

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
UN	.017975	.034820	.51624[.010]
INF	.0012799	.4845E-3	2.6419[.014]
GDP	.0012397	.7718E-3	1.6064[.020]
TGDP	-.0018207	.014501	-.12556[.001]
C	.032954	.011350	2.9033[.007]

Source: Researcher's findings

There is an error correction model (ECM) in accordance with any long-term relationship, and it connects the short-term fluctuations of variables to their long-term equilibrium values. The error correction model is used to combine the short and long term relationships. The co-integrated relationships between a set of economic variables provides the statistical basis for use of error correction models. The error correction model connects the short-term fluctuations of variables to their long-term equilibrium values. For adjustment of error correction model, we should put the error terms of co-integrated regression for estimating the long-term coefficients of model with a time lag as an explanatory variable

along with the first order difference of other model variables; and estimate the model coefficients by the help of least squares method. Table (5) presents the results of estimating the error correction model for evaluating how the short-term fluctuations of inflation, unemployment, economic growth and collected tax rates in both models will lead to the long-term equilibrium. ECM (-1) coefficient, which refers to the speed of adjusted process of imbalance, is taken into account in this model. In other words, ECM coefficient indicates that what percentage of target variables is in line with their long-term procedures in each year. As shown, all coefficients of error correction model are statistically significant with a probability of more than 90 percent. Error correction coefficient is estimated equal to 0.52 in model, and it is statistically significant. If this coefficient is negative, the imbalances will move towards the long-term imbalance. The value of this coefficient indicates that according to both models in each year, about 50% of imbalance in a period (year) is adjusted (eliminated) in another period. This figure indicates that the adjustment is towards the fairly equilibrium.

Table 5: Results of error correction model (ECM) estimation

Error Correction Representation for the Selected ARDL Model
ARDL(1,0,0,1,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is dGINI
34 observations used for estimation from 1357 to 1392

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dUN	.027449	.052387	.52397[.005]
dINF	.0019545	.8144E-3	2.4001[.024]
dGDP	.0040189	.0011057	3.6349[.001]
dTGDP	-.0027803	.022441	-.12389[.002]
dC	.050321	.017580	2.8624[.008]
ecm(-1)	-0.5270	.21665	-7.0483[.000]

List of additional temporary variables created:
dGINI = GINI-GINI(-1)
dUN = UN-UN(-1)
dINF = INF-INF(-1)
dGDP = GDP-GDP(-1)
dTGDP = TGDP-TGDP(-1)
dC = C-C(-1)

ecm = GINI -.017975*UN - .0012799*INF - .0012397*GDP + .0018207*TGDP -.032954*C

R-Squared	.84269	R-Bar-Squared	.80034
S.E. of Regression	.032111	F-stat. F(5, 27)	23.2139[.000]
Mean of Dependent Variable	.0019015	S.D. of Dependent Variable	.071865
Residual Sum of Squares	.026809	Equation Log-likelihood	73.2273
Akaike Info. Criterion	65.2273	Schwarz Bayesian Criterion	59.1218
DW-statistic	1.8413		

Source: researcher's findings

4- Conclusion

This study estimates the impact of inflation, unemployment, economic growth and the direct taxes to GDP ratio (TGDP) on Gini coefficient as an index of income distribution based on ARDL method in order to investigate the relationship between the macroeconomic variables and the direct taxes to GDP ratio (TGDP) with income distribution. Therefore, the reliability of variables is first tested according to Augmented Dickey-Fuller (ADF) and Phillips-Perron test (PP), and then the model is estimated in the short and long-terms and finally the error correction model is estimated. The obtained results reflect the positive impact of unemployment, inflation and economic growth rates as well as the negative impact of direct taxes to GDP ratio. According to the estimated long term model, the increased GDP growth will increase Gini coefficient in the long term, and thus it will lead to an increase in the income inequality, while the increased in taxes will reduce Gini coefficient, and thus reduce the income inequality. The unemployment and inflation rates also have positive impact on Gini coefficient in the long term. According to the results of error correction model, the error correction coefficient is equal to 0.5 which indicates the appropriate speed of error adjustment. In general, the obtained results confirm the research hypothesis according to

which the increase in direct taxes in the Iranian economy improves the income distribution and the fact that the specific distributed tools and policies can establish fair distribution in Iran. Therefore, the subsidy reform from rich to poor people plays a more effective role in reducing the income inequality; hence, the government can reduce the social and economic inequalities by its useful and constructive measures. Meanwhile, the economic authorities and planners are suggested adopting the statutory policies for moderating the income inequality and improving the tax system among different income groups. The other suggestions of this research include the increase in production potential of country in order to create job and overcome the unemployment, and complete and implement the comprehensive tax plans in order to enhance and increase the taxes particularly the wealth, income and direct taxes.

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