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Inclusive Growth in Iran's Provinces (2004 -2015)

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Abstract

This paper aims to focus on inclusive growth and its impact on multidimensional poverty and inequality in Iran's provinces on the basis of social mobility index. The results suggest, that although the multi-dimensional poverty has decreased, participation of active labor force has a decisive role in inclusive growth and reduction of absolute multi-dimensional poverty of the provinces. But labor participation has been accompanied by inequality of income, which indicates that the opportunity for economic growth has been unevenly distributed, as higher income deciles have more benefits. Income inequality has moderated the positive and significant effect of GDP growth on its inclusiveness. Inflation also has a negative and significant effect on the inclusive growth of the provinces. The research findings indicate that the economic and financial policies, including the ratio of bank credit to GDP and government social expenditures, have a positive and significant effect on the acceleration of inclusive growth and have been able to generate inclusive, albeit unsustainable growth in the provinces. This inclusive growth has led to a reduction in poverty and inequality. However because of its volatility and instability, it has no significant impact on poverty and inequality and did not directly reduce poverty and inequality in the provinces.

Key Words: Inclusive Growth, Multidimensional Poverty, Income Inequality in Iran's Provinces, Systemic Generalized moment.

1. Introduction

In Iran, after the Islamic Revolution and the end of the Iran-Iraq war, we have seen economic growth, but this growth has been uneven and often accompanied by poverty and inequality. For example, in the years 1991-2010, despite the GDP growth rates of above 5%, the average Gini coefficient was 0.40 and has not been improved. The average share of the 10% of the most affluent to 10% of the poorest population has been 14.75

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times from 1991 to 2016.[1] In terms of economic growth, it is a question of what are the benefits of economic growth to each income deciles? Do the poor also benefited from economic growth? Is income inequality also declining?

Inclusive growth creates equal opportunities for contributors to economic growth, and various sectors of society benefit from economic growth. According to this definition, the goals of growth should go beyond just increasing GDP and should also reduce poverty and inequality. In that case, economic growth is an intermediate objective and is a means to reduce poverty and inequality and creating job and eliminating the deprivation of people. Although economic growth is the most important component of any poverty reduction program, but growth stability and its impact on poverty reduction entail inclusive growth. The purpose of this paper is to analyze inclusive growth and its impact on poverty and inequality in Iran's provinces. Between 2004 and 2015, there was economic growth in Iran, but the question is about the inclusiveness of that growth and what impact has it had on multidimensional poverty and inequality?

In addition, it should be noted that inclusiveness of economic growth and reduction of poverty and inequality will not happen automatically. Therefore, economic policies have a decisive role in the inclusiveness of growth. Moreover, we need to measure the impact of economic policies on multidimensional poverty and income inequality. Since economic growth has a different impact on poverty and inequality in provinces, the study seeks to examine the inclusive growth using provincial panel data. Income inequality partly undermines the benefits of economic growth, but economic growth has the ability to reduce poverty. Given this fact, simultaneous attention to growth and equity is necessary. Therefore, integrated measurement of growth and income distribution is carried out for the provinces of Iran during 2004 to 2015.

Measuring inclusive growth is carried out using the social mobility function in the provinces of Iran, which allows simultaneous attention to growth and Equality for measuring inclusive growth and identifying its determinants. While this study focuses on the growth outcome, it also focuses on its inclusiveness and participation of the majority of the workforce in the growth process.

[1] Central Bank of Iran, Data Bank of Economic Time Series

2. Literature Review

The use of the term "inclusive" in describing economic growth can be rooted in Kakwani and Pernia (2000), who discussed pro-poor growth. Ali and Sun (2007, 12) also discussed relative pro-poor growth as a growth that not only creates new economic opportunities, but also ensures equal access to opportunities for all, especially for the poor. They utilized a method for measuring inclusive growth using the social opportunity function, which is similar to the social welfare function.

They define the inclusive growth in the model as a growth process that increases social opportunities and depends on two factors: (1) the average opportunities available to the public and (2) how these opportunities are distributed or shared among people. Thus, changing the orientation of economic growth from outcome to opportunity.

Ianchovichina and Lundstrom (2009, 2) consider inclusive growth as "broad-based across sectors", which includes a large proportion of the labor force. This definition of inclusive growth indicates a direct relationship between the micro and macro determinants of economic growth.

Fritzen (2002) examines the relationship between income inequality and urban growth in the 32 major cities of Vietnam during 1980 to 2000. The results indicate that during the course of study, income inequality in these cities has increased, which has led to a significant reduction in urban inclusive growth.

Agrawal (2007) explores the long-term relationship between inequality and inclusive growth in Kazakhstan during 1975-2005 using the Johansson-Juselius co-integration approach. The results indicate that with increasing income inequality, inclusive growth has decreased in cities.

Suryanaryiayana (2008) uses a panel data approach to examine the determinants of inclusive growth in Indian states between 1993 to 2005. The results indicate that inequality of income and unemployment rate are the most important determinants of inclusive growth in the Indian states and have a negative significant effect on inclusive growth.

Lin et al. (2008) examined inequality of income in China using household data in order to analyze the factors affecting inclusive growth in the provinces of China during 1990 to 2004. The study shows that increases in income inequality has led to a significant decrease in the inclusive growth of Chinese provinces.

Sabiasachi (2013) examined economic growth in India, using panel data to investigate the determinants of urban growth in 52 mega cities in India between 2000 and 2010. The results indicate that the increase in inclusive growth in urban areas is accompanied by a reduction in income inequality and poverty.

Anand et al. (2014) examined the determinants of inclusive growth and poverty reduction in India by investigating the role of macroeconomic policies using panel data aims to analyze the development of poverty, inequality and inclusive growth in India during 2004-2009. For measuring inclusive growth, they integrated growth and income distributions into a single test.

Also, Datt and Ravallion (1992) methodology has been used to investigate the role of inclusive growth in poverty reduction. The results indicate that economic growth is a main determinant in reducing poverty and growth inclusiveness. Their analysis indicates that the states with higher educational and social expenditures and higher educational achievements experience more inclusive growth outcomes. Macro-financial stability also has been important to promote inclusive growth.

Finally, Sadeghi (2013) examined the relationship between Gini coefficient as an indicator of income inequality and GDP growth in Iran's provinces during the years 2000-2009, using generalized moment method. The results indicate that the increase of the Gini coefficient and unemployment had a negative and significant effect on the GDP of Iran's provinces. Also, GDP growth had a negative and significant effect on the increase of the Gini coefficient.

3. Multidimensional Poverty and Income Inequality and Inclusive Growth in the Provinces

3.1. Measuring multi-dimensional poverty

The multi-dimensional poverty index goes beyond income-based poverty levels. For calculating absolute multi-dimensional poverty, multiple deprivations in terms of education, health and living standards are calculated according to Alkir and Foster 2007 and 2009.

Since the data used in the calculations should be for a given year, in a booklet entitled “Multidimensional Poverty Index in Iran”, for 2006, the Population and Housing Census in Iran, is considered as the base year, and this index calculated for 30 provinces of Iran for the year 2006.

We calculated the multi-dimensional poverty index based on the latest available census data (2011). In calculating the multi-dimensional poverty index, our criterion was provincial privileges.[1] The classification of Iran's provinces conducted in terms of their total score for three aspects.

Table 1: Ranking of Iran's provinces based on the scores obtained in the multi-dimensional poverty index (percentage)

province	score – year 2006	score - year 2011	province	score – year 2006	score - year 2011
Hamedan	8.42%	15.2%	Yazd	11.46%	16.47%
Qom	8.71 %	11.4%	Qazvin	11.5%	13.11%
East Azarbaijan	8.83%	11.24%	Gilan	11.8%	14.0%
Mazandaran	9.07%	15.77%	Khorasan Razavi	11.8%	14.78%
Chaharmahal and Bakhtiari	9.19%	16.09%	Golestan	12.00%	17.10%
Markazi	9.84%	13.16%	Ilam	12.69%	16.13%
Kurdistan	9.97%	13.45%	Tehran	12.70%	11.65%
Ardebil	10.13%	12.79%	Isfahan	13.08%	10.06%
Semnan	10.18%	14.01%	Khuzestan	13.68%	15.13%
Zanjan	10.5%	17.7%	Lorestan	14.61%	15.55%
Bushehr	10.83%	20.7%	Hormozgan	14.84%	19.17%
West Azarbaijan	10.9%	17.2%	Fars	16.77%	16.35%
North Khorasan	11.0%	18.23%	Kermanshah	16.82%	12.79%

Table 1(Continued)

Bushehr	10.83%	20.7%	Hormozgan	14.84%	19.17%
West Azarbaijan	10.9%	17.2%	Fars	16.77%	16.35%
North Khorasan	11.0%	18.23%	Kermanshah	16.82%	12.79%
Kohkiloyeh and Boyer Ahmad	11.09%	18.03%	South Khorasan	18.62%	20.65%
Kerman	11.46%	20.39%	Sistan and Baluchestan	20.38%	28.58%

Source: For 2006, the Yeganlow, Multidimensional Index of Poverty in Iran (Explaining Indicators and Estimating Based on Provinces), 2014, p:73. For 2011, research calculations.

3.2. Measuring inequality growth

To measure the inequality of household income deciles in each province, we utilized the Thiel index, using household expenditures due to the reliability of data on the household expenditures rather than household income.

Statistical Center of Iran also calculated the Gini coefficient for each province using household expenses.[2] In this coefficient, the transfer of income from a rich person to a poor person reduces the Theil index. The

[1] See Appendix A for Dimension and Indicators of Multi-Dimensional Poverty and its Criteria for Iran's Provinces.
[2] Statistical Center of Iran, Income distribution in urban and rural households, 2008.

advantage of this index to Gini coefficient is that it gives more weights on poor households.

3. 3. Measuring Inclusive Growth

Usually analyzes of economic growth, poverty or inequality have been carried out separately. In our study, we utilized Anand et al. method (2013), which integrates two sets of analyzes into an integrated measure of inclusive growth.

Measuring inclusive growth is based on the social mobility function in which inclusive growth depends on two factors: (1) income growth and (2) income distribution.

As with the consumer theory, where indifference curve indicates aggregate demand shifts over time, this analysis decomposes the substitution effect and the income effect into growth and distribution components.[1] Figure 1 illustrates the results of measuring inclusive growth and the growth of income inequality for each province.

[1] It should be noted that in measuring inclusive growth, decreasing weights should be allocated to higher income deciles. For example, if a dollar is transferred from the tenth deciles to the first decile, inclusiveness of growth will increase more than when a dollar is transferred from the tenth decile to the second decile, and so on. Therefore, for the sake of this point, the household expenditure is used instead of household income. As Kariy and Chen (2017) stated the poor often consume any increase in income, while for the rich, increases of income, have minimal effects on consumption. For measuring inequality, we measured inequality based on consumption or expenditure.

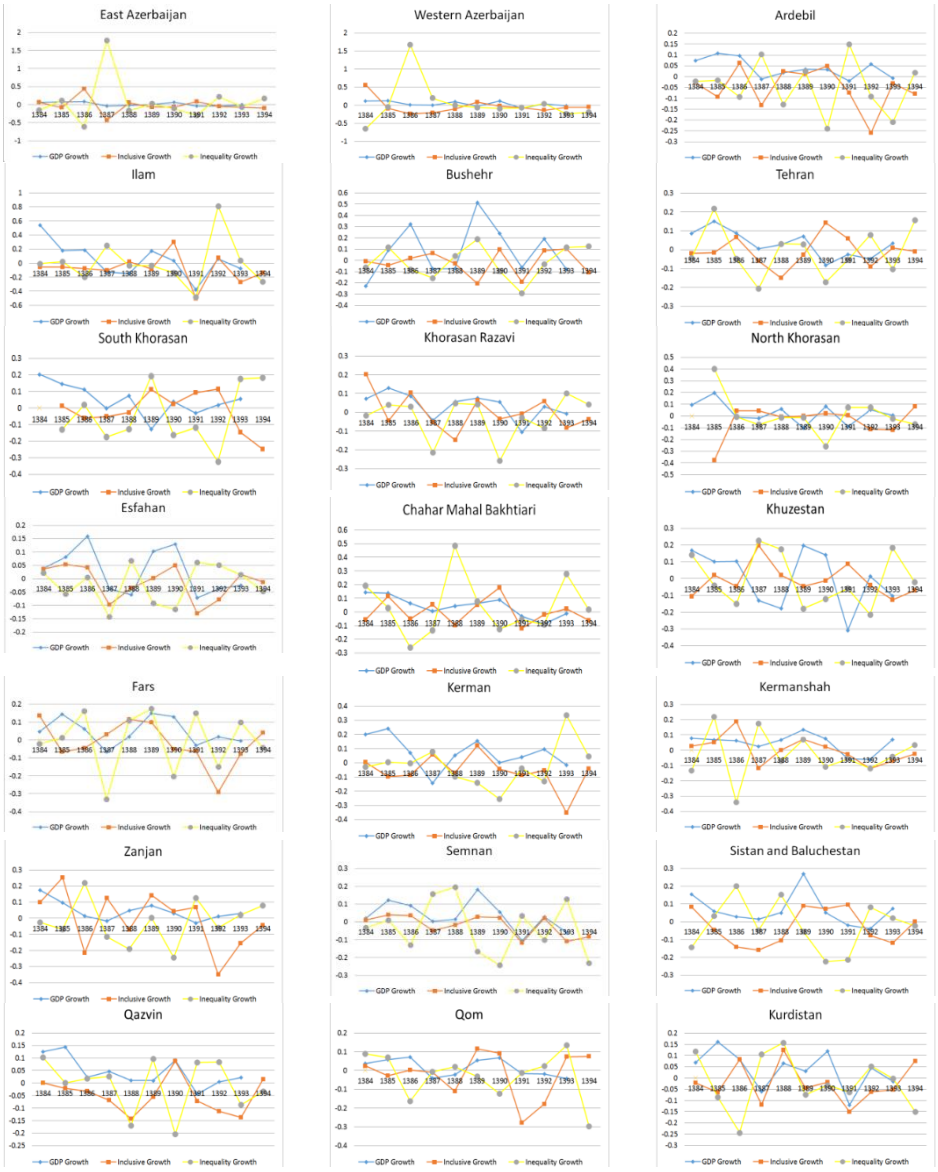


Figure.a. inclusive growth and the growth of income inequality for each province

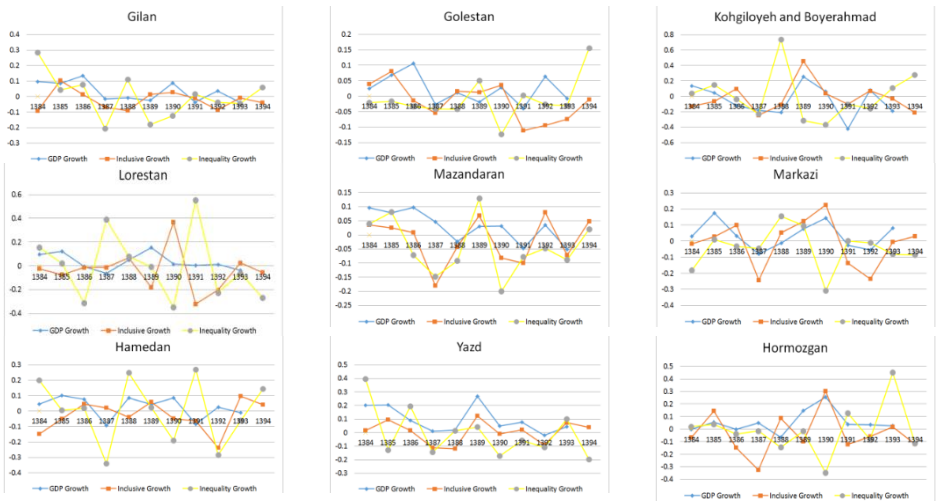


Figure.a.(continued)
Source: Research calculations

3.4. The structure of the model specified in a static panel

In this study, the model has been specified to explain the relationship between the role of macroeconomic policies and the explanatory factors (economic growth, inequality growth and active labor force participation) with inclusive growth of Iranian provinces.

$$\ln \bar{y}^{\bullet}_{it} = \alpha_i + \theta_2 \ln GDP_{it} + \theta_3 \ln I_{it} + \theta_4 \ln CON_{it} + \theta_5 \ln CTG_{it} + \theta_6 \ln SE_{it} + \theta_7 \ln P_{it} + u_{it} \quad (1)$$

$$i = 1,2,3,\dots,30 \qquad t = 2004,\dots,2015$$

where:
$\bar{y}^{\bullet}$: The index of social mobility in the province[1]
α_i: The fixed effects of the cross-section of provinces
GDP: real GDP of the provinces
I: Theil's Inequality Index (alternative criterion for equality of income for households income deciles per Province)
CON: active labor force Participation per province
CTG: ratio of Bank Credit to GDP per province
SE: real social expenditures per province
P: consumer price index

[1] The relative changes in the social mobility index of provinces ($d\bar{y}^{\bullet}$) are the inclusive growth of the province.

Inclusive growth should also reduce poverty and inequality. Also, according to empirical studies, one can focus on the study of the role of macroeconomic policies on poverty and inequality of provinces.
Control variables are also introduced into the model, so model (2) and model (3) are specified and used as follows:

$$\ln I_{it} = \alpha_1 + \delta_2 \ln \bar{y}^*_{it} + \delta_3 \ln GDP_{it} + \delta_4 \ln CON_{it} + \delta_5 \ln CTG_{it} + \delta_6 \ln SE_{it} + u_{it} \quad (2)$$
$$i = 1,2,3,\dots,30 \qquad t = 2004,\dots,2015$$

$$pov_{it} = \alpha_1 + \lambda_1 \ln \bar{y}^*_{it} + \lambda_2 \ln GDP_{it} + \lambda_3 \ln CON_{it} + \lambda_4 \ln CTG_{it} + \lambda_5 \ln SE_{it} + \lambda_6 \ln P_{it} + u_{it} \quad (3)$$
$$i = 1,2,3,\dots,30 \qquad t = 2006,2011$$

In which pov: the multidimensional poverty of the provinces. Other symbols of the two equations are the same as in model 1.
Many of the economic relationships are inherently dynamic, and one of the benefits of the panel data is to allow the researcher to better understand the dynamics of adjustment.

These dynamic relationships are characterized by the presence of a dependent variable on the right side and on the side of the regressors.

Due to the dynamic structure in the model, Hsiao (1986) and Arlano and Bond (1991) indicated that the method of fixed effects will provide inconsistent estimates. Moreover, if u_i and x_u has no correlation, Then the GLS method is used, which will then be consistent, but if some of the explanatory variables are internal, then the GLS is inconsistent.

Since y_{it} is a function of μ_i, $y_{i,t-j}$ is also a function of μ_i, Therefore, $y_{i,t-j}$ correlates with the error term and is recognized as an endogenous variable. Therefore, due to the existence of the factor of the endogenous variables and the lag of the dependent variable, along with the problem of autocorrelation of the error term, in this study, in addition to estimating the panel data using the fixed and random effects method, we utilize the dynamic panel.

3.5. The structure of the model specified in the dynamic panel method

$$\ln \bar{y}^*_{it} = \alpha_1 + \beta_t + \theta_1 \ln \bar{y}^*_{it-1} + \theta_2 \ln GDP_{it} + \theta_3 \ln I_{it} + \theta_4 \ln CON_{it} + \theta_5 \ln CTG_{it} + \theta_6 \ln SE_{it} + \theta_7 \ln P_{it} + u_{it} \quad (4)$$
$$i = 1,2,3,\dots,30 \qquad t = 2004,\dots,2015$$

$$\ln I_{it} = \alpha_1 + \beta_t + \delta_1 \ln I_{it-1} + \delta_2 \ln \bar{y}^*_{it} + \delta_3 \ln GDP_{it} + \delta_4 \ln CON_{it} + \delta_5 \ln CTG_{it} + \delta_6 \ln SE_{it} + u_{it} \quad (5)$$
$$i = 1,2,3,\dots,30 \qquad t = 2004,\dots,2015$$

Since the model has two problems of internalization of explanatory variables and dynamic structure, hence, based on Baltaji (2001) and Arlano and Bond (1991), it should be estimated by the method of two-stage least squares or by generalized moment method. Due to the type of tools used in the two-stage least squares method, the variances of higher estimation coefficients may be estimated and leads to inconsistency. Therefore, the most appropriate estimation for dynamic panel models is to estimate the generalized moments.

Blundel and Band (1998) have argue that the lag of variables on the level is a weak tool for the regression equation in difference. In order to solve this problem, Blundel and Band (1998) have proposed estimator of system generalized moment which in a system combines regression at the level with regression in difference.

Blundel and Bond (1998) indicate that GMM system estimator yields high efficiency relative to the first order difference GMM.

The consistence of GMM estimators and the results obtained from the generalized Moment method for panel data is valid based on the assumptions made. Therefore, in addition to Sargan test, we need to test the order of the auto regression of the error term.

In our study, due to the more efficient use of generalized system moments than other methods, we use the GMM estimation system for fitting models 1 and 2. Equation (3) due to lack of access to the data (limited to the general population and housing census of 2006 and 2011), we can not run a dynamic panel data for estimating the model. Therefore, estimating the model using static panel model and also because of the time limit of available information, the coefficients are not firmly reliable, but to show the role of inclusive growth and government's economic policies on multidimensional poverty of the provinces. We also estimate equation (3).

3.6. Data

The data collection sources used in this study are presented in Table 2. The study period was limited to 2004- 2015 due to data availability on the expenditure of household deciles per province of Iran before the year 2003.

Table 2: Sources of research data

Data	Source
participation of active labor force in the provinces	the statistical yearly report of Iran- Labor force by country's provinces from Statistical Center of Iran
GDP data	the regional accounts of the Statistical Center of Iran
total granted facilities of the banks and the Credit Institute by the provinces	the provincial yearly statistics of budget of the province
capital assets expenditure (development) of the provinces on social affairs	the provincial yearly statistics of budget of the province
inflation rate	the statistical yearly report of Iran- consumer price index (constant 2004) by country's provinces from Statistical Center of Iran
To calculate income inequality per province (Thiel index) and measuring inclusive growth	we used the data on the net expenditure for food and non-food consumption of household deciles per province during 2004-2015 from Statistical Center of Iran

Source: Research calculations

The data used to calculate the multi-dimensional poverty is also derived from the results (detailed in the province) of the Population and Housing Census of 2011 Statistical Center of Iran.

All data used in this study for 30 provinces of Iran are based on country divisions and availability of information.[1]The summary statistics of the data used is presented in Table 3.

3.7. Variable stationary test

Before the analysis, Levine, Lynn and Chu tests are used to examine the stationary of variables (unit root test). As shown in Table 4, for all variables in logarithmic format, the null hypothesis for the existence of the unit root is rejected and hence variables are stationary.

[1] The provinces include in this research are as follows: Hamedan, Qom, East Azarbaijan, Mazandaran, Chaharmahal and Bakhtiari, Markazi, Kurdistan, Ardebil, Semnan, Zanjan, Bushehr, West Azarbaijan, North Khorasan, Kohkiloyeh and Boyer Ahmad, Kerman, Yazd, Qazvin, Gilan, Khorasan Razavi, Golestan, Ilam, Tehran, Isfahan, Khuzestan, Lorestan, Hormozgan, Fars, Kermanshah, South Khorasan, Sistan and Baluchestan. Due to the fact that the data of the province of Alborz were not available before the year 2011, this province has abondened.

Table 3: Descriptive Statistic

variable	observation	Mean	Standard Deviation
$\ln \bar{y}^*$	360	21.41499	.0124189
$\ln GDP$	360	12.81788	.0475495
$\ln I$	360	-1.628197	.0132074
$\ln CON$	330	3.634866	.0054643
$\ln CTG$	330	3.644448	.0285453
$\ln SE$	330	-.1067717	.0476053
$\ln P$	330	5.562409	.0327422

Source: Research calculations

Table 4: Levin, Lynn and Chow unit root test results for the variables

variable	statistic	P-Value
$\ln \bar{y}^*_t$	-10.1803	0.0000
$\ln GDP_t$	-8.9203	0.0000
$\ln I_t$	-5.3180	0.0000
$\ln CON_t$	-6.1160	0.0000
$\ln CTG_t$	-1.8685	0.0308
$\ln SE_t$	-9.1279	0.0000
$\ln P_t$	-2.5094	0.0060

Source: Research calculations

3.8. Results

Limer and Hausman tests have done before model estimation. In the Limer test, the null hypothesis implies using Pooling data and the alternative hypothesis to the Panel data method. In the Hausman test, the null hypothesis emphasizes the use of the Random Effect method and the alternative hypothesis on using the Fixed effect method. In model (3), the Pagan Gadfree test is used to select between pooling data and Random effect method. The test statistic is as follows:

Table 5: Limer, Hausman and Breausch, Pagan's tests results

Test	Model 1	Model 2	Model 3
F- Limer	15.45 (0/0000)	4.83 (0/0000)	2.03 (0.03)
Hausman test	39.01 (0/0000)	18.50 (0.0024)	1.07 (0.9571)
the Breausch Pagan Gadfree test	-	-	4.27 (0.0194)
results	Panel- The Fixed effect	Panel- The Fixed effect	Panel- The Random effect

Source: Research calculations

So far, we examined the model's fitting method, assuming the classic assumption of the regression model. But after fitting the model, it needs to test the accuracy of the estimates. Therefore, before we make the final estimate of the model, the classic assumptions are tested.

3.9. Colinearity and coefficient of correlation

For co-linearity test the correlation coefficients between explanatory variables are utilized. If the correlation coefficients are relatively high, it means strong colinearity. Correlation coefficients of the variables of the model are depicted in table 6.

Table 6: Correlation coefficients of model variables

	$\ln \bar{y}^*$	$\ln GDP$	$\ln I$	$\ln CON$	$\ln CTG$	$\ln SE$	$\ln P$
$\ln \bar{y}^*$	1.0000						
$\ln GDP$	0.4091*	1.0000					
$\ln I$	-0.1426*	0.0431	1.0000				
$\ln CON$	0.1997*	-0.0158	0.1392*	1.0000			
$\ln CTG$	0.0431	-0.0677	0.1626*	0.3184*	1.0000		
$\ln SE$	0.1398*	-0.3145*	0.2206*	-0.1309	-0.2317*	1.0000	
$\ln P$	-0.3680*	0.0233	-0.5051*	-0.2040*	-0.0930	-0.6121*	1.0000

Source: Researchers' calculations. * It is significant at the 5% level.

It is usually said that if for a regression equation, the correlation coefficient between explanatory variables is greater than √ (R 2), it is a sharp linearity . √ (R 2) for models (1), (2) and (3) are 0.72, 0.51, 0.63 respectively.

Except for the correlation coefficient between inflation and the growth of government social expenditures (0.6) Correlation coefficients, for other variables linearity, in this case, are negligible. Therefore, in the model (2), we eliminated inflation variable.

In addition, one way to examine the colinearity of variables is calculating variance inflation factor (VIF).

Chatterjee et al. Stated that the value of VIF should not exceed 10. The VIF results for each model illustrated in table 7, 8 and 9.

Table 7: The values of VIF for variables of the model (1)

variable	$\ln P_{it}$	$\ln SE_{it}$	$\ln CTG_{it}$	$\ln CON_{it}$	$\ln I_{it}$	$\ln GDP_{it}$
VIF	2.56	2.47	1.29	1.24	1.38	1.26

Source: Research calculations

Table 8: the values of VIF for variables of model (2)

Variable	$\ln \bar{y}^{*}_{it}$	$\ln SE_{it}$	$\ln CTG_{it}$	$\ln CON_{it}$	$\ln GDP_{it}$
VIF	1.50	1.40	1.20	1.19	1.59

Source: Research calculations

Table 9: values of the VIF for variables of model (3)

variable	$\ln \bar{y}^{*}_{it}$	$\ln P_{it}$	$\ln SE_{it}$	$\ln CTG_{it}$	$\ln CON_{it}$	$\ln GDP_{it}$
VIF	1.24	1.44	2.31	1.84	1.56	1.81

Source: Research calculations

3.10. Variance heteroscedasticity and auto-correlation tests

If the number of individual units is more than the study period, one expects for the error terms to have variance heteroscedasticity. If there is autocorrelation, the estimated parameters will be unbiased, but estimates are inefficient. This inefficiency will not be eliminated even in large samples, which leads to inaccurate inferences. Therefore, the occurrence of this problem in the model can put under question the basis of the estimated regression line.

Therefore, after determining the method of model fitting, the variance heteroscedasticity and auto correlation Wooldridge tests (2002) have done. The results of these tests are presented in tables 10 and 11.

Table 10: Wooldridge auto correlation test results

Model	Statistic χ^2	df	P-Value	results
Model 1	10.222	1 ,29	0.0033	AR(1)
Model 2	9.967	1 ,29	0.0037	AR(1)

Source: Research calculations

Table 11: The results of variance hetroscedasticity test

Test	Model	Statistic χ^2	df	P-Value	results
variance hetroscedasticity for The Fixed effect- wald test	Model 1	1594.42	30	0.0000	Fixed effect with variance hetroscedasticity
variance hetroscedasticity for The Fixed effect- wald test	Model 2	507.10	30	0.0000	Fixed effect with variance hetroscedasticity
variance hetroscedasticity likelihood ratio test	Model 3	54.51	29	0.0028	Random effect with variance hetroscedasticity

Source: Research calculations

Model Estimation in the Static Model				Model Estimation in the Dynamic Model			
Inclusive growth model							
The results of model estimation using the fixed effect model with variance hetroscedasticity and auto correlation (FGLS)				Results of estimation of the model by generalized moment method			
dependent variable : $\ln \bar{y}^{*}_{it}$				dependent variable : $\ln \bar{y}^{*}_{it}$			
variable	coefficient	z -statistic	P-Value	variable	coefficient	z -statistic	P-Value
C	18.91976	46.41	0.000*	C	10.23224	10.04	0.000*
				$\ln \bar{y}^{*}_{it-1}$	.4091045	7.83	0.000*
$\ln GDP_{it}$	.1452492	11.39	0.000*	$\ln GDP_{it}$	.1349037	4.42	0.000*
$\ln I_{it}$	-.2798167	- 10.48	0.000*	$\ln I_{it}$	-.2182097	-10.82	0.000*
$\ln CON_{it}$	.2595729	2.87	0.004*	$\ln CON_{it}$	.2180421	2.91	0.004*
$\ln CTG_{it}$	.0589715	2.52	0.012*	$\ln CTG_{it}$	.0782409	5.41	0.000*
$\ln SE_{it}$	.0095498	1.10	0.272	$\ln SE_{it}$	.0086225	1.70	0.089**
$\ln P_{it}$	-.1828878	- 10.34	0.000*	$\ln P_{it}$	-.1362493	-8.55	0.000*
statistic χ^2	336.90	---	0.0000*	statistic χ^2	5390.74	---	0.0000*
N	30	---	---	N	30	---	---
NT	330	---	---	NT	330	---	

Note: *=Significant at 5%, **=Significant at 10%.

Model Estimation in the Static Model				Model Estimation in the Dynamic Model			
Inequality growth Model							
The results of model estimation using the fixed effect model with variance hetroscedasticity and auto correlation (FGLS)				Results of estimation of the model by generalized moment method			
dependent variable : $\ln I_{it}$				dependent variable : $\ln I_{it}$			
variable	coefficient	z -statistic	P-Value	variable	coefficient	z - statistic	P-Value
C	3.041924	2.36	0.018 *	C	8.716919	9.92	0.000*
				$\ln I_{it-1}$	3925775.	8.58	0.000*
$\ln \bar{y}^{*}_{it}$	-.3688427	- 5.44	0.000*	$\ln \bar{y}^{*}_{it}$	- .3428111	- 8.61	0.000*
$\ln GDP_{it}$	.0625212	3.22	0.001*	$\ln GDP_{it}$	- .2914564	- 5.83	0.000*
$\ln CON_{it}$	.5437166	3.84	0.000*	$\ln CON_{it}$	.2806667	2.36	0.018*
$\ln CTG_{it}$	.1276016	4.23	0.000*	$\ln CTG_{it}$	.101376	6.18	0.000*
$\ln SE_{it}$	.0784484	5.36	0.000*	$\ln SE_{it}$	.0960253	7.74	0.000*
statistic χ^2	62.65	---	0.0000	statistic χ^2	764.37	---	0.0000
N	30	---	---	N	30	---	---
NT	330	---	---	NT	330	---	

Note: *=Significant at 5%, **=Significant at 10%.

Multi-dimensional poverty model

Table 12: Results of model estimation by random effects method

dependent variable: pov_{it}			
variable	**coefficient**	**z -statistic**	**P-Value**
C	84.98631	4.46	0.000*
$\ln \bar{y}^{*}_{it}$	- 2.142763	- 2.59	0.010*
$\ln CON_{it}$	- 12.6385	- 4.73	0.000*
$\ln CTG_{it}$	0.6397657	1.43	0.153
$\ln SE_{it}$	1.284134	2.52	0.012*
$\ln P_{it}$	3.457041	6.08	0.000*
statistic χ^2	216.48	---	0.0000*
N	30	---	---
NT	60	---	---

Note: *=Significant at 5%, **=Significant at 10%.

Finally, after estimating the model in the dynamic model, tests must be done by the system's generalized moment to confirm the accuracy of the results. The results of the tests are presented in table 13.

Table 13: tests to validate the results of estimating patterns in the dynamic model

essential tests			**Inclusive growth model**	**Inequality growth Model**
The Arlano-Bond test for auto correlation	**AR(1)**	z -statistic	- 2.7064	- 3.3343
		P-Value	0.0068	0.0009
	AR(2)	z -statistic	0.6502	.48608
		P-Value	0.5156	0.6269
Sargan test		statistic χ^2	24.58248	26.25636
		P-Value	1.0000	1.0000

Regarding the results of the Arlano-Bond test for autocorrelation, the null hypothesis on non-existence of autocorrelation for the first order between the difference of error terms rejected and for the second order, this hypothesis has not rejected. Thus, the degree of autocorrelation of error term is of the first order. Therefore, it can be said that the Arlano-Bond method is a suitable method for estimating this model and eliminating the fixed effects. Also, based on Sargan test results, null hypothesis on non-

existence of auto correlation of error terms with instrumental variables or in fact validity of instrumental variables is not rejected and instrumental variable of the model (second order lagged dependent variable) is a suitable variable for estimating the parameters and results are valid.

4. Interpreting the results of the model

In sum, based on the results of the study, from both dynamic and static models, it can be concluded from models (1) and (4) that economic growth has a positive and significant effect on inclusive growth.

This empirical result is in line with the views of Launchovichina and Lundstrom (2009), McCainley (2009), Kakwani and Pernia (2000). Also, it is consistent with empirical studies of Alexei Ki Rio (2017), Anand et al. (2014).

Therefore, inclusive growth requires economic growth, but it does not necessarily mean that growth and inclusive growth are equal.

In addition, sustainable and stable economic growth is essential for inclusive growth, but inequality has negatively affected on inclusive growth in Iran.

This empirical result is consistent with Anand et al. (2014), Atih and Moosem (2012), Lin et al. (2008), Ali and Sun (2007). Therefore, for growth inclusiveness, it is needed to create and expand an equal environment for all people in the community to participate in the growth process and benefit from it in the provinces.

Increased participation of the labor force also has a positive and significant impact on inclusive growth. The most important factor in the inclusive growth was the growth of participation of active labor force in the provinces. This empirical result is consistent with the views of McCainley (2009), Lanco Vichina and Landstrom (2009), Kakwani and Pernia (2000).

Therefore, inclusive growth requires the participation of the active labor force of the provinces in the growth process, which can be clearly seen in its high coefficient and significance.

The growth of the ratio of bank credits to GDP has also had a positive and significant impact on inclusive growth which is consistent with the empirical results of Anand et al. (2014 and 2013).

Inflation also has a negative and significant effect on the inclusive growth of the provinces. This empirical result is consistent with the theory and empirical studies of Anand et al. (2013 and 2014).

According to dynamic estimation, the lagged variable of inclusive growth has a positive and significant effect on the inclusive growth of the provinces. This indicates that with enhancing inclusive growth in the past period, growth inclusiveness in the provinces increases, therefore, pointing to the necessity of stability in the growth inclusiveness of the provinces.

Also, based on both dynamic and static estimates, with models (2) and (5), it can be concluded that inclusive growth has a negative and significant effect on the growth of inequality in the provinces and has been able to reduce it.

As the results indicate, an important factor in reducing the growth of inequality has been inclusive growth in the provinces. This empirical result for the provinces of Iran is in accordance with the findings of McCainley (2011), Lanchovichina and Landstrom (2009), Ali and Sun (2007), Kakwani and Pernia (2000).

Static estimation indicates that GDP growth not only failed to reduce the growth of inequality in the provinces, but also has a positive and significant effect on it. Dynamic estimation in this study is consistent with the findings of Sadeghi (2013), which also uses dynamic generalized moment method, and indicate that GDP growth has a negative and significant effect on the growth of inequality in the provinces, which is consistent with Sun and Kakwani (2008).

The growth of labor force participation also has a positive and significant effect on the growth of inequality. The growth of the ratio of bank credits to GDP has also a significant and positive effect on the growth of inequality. Many studies acknowledged that financial deepening provide more opportunities for the rich and has an adverse effect on poverty alleviation, unless such opportunities are given as microfinance to small and medium enterprises (TANG 2008, Dollar and Kraay 2002, Calderon and Serven 2003, Lopez 2004).

The growth of social expenditures of the government has also a positive and significant effect on the growth of inequality. In an inter-provincial study, Khoshkar (2007) also finds that the most important factor in increasing the level of income inequality is government expenditure.
According to the dynamic estimation, the lag of growth inequality has a significant impact on the inequality in the current period, which is consistent with Sadeghi (2013).

Therefore, according to the results of the growth model of inequality, by estimating the dynamic (in this study, the generalized system moment

method), as in the stationary estimation (in this study, the fixed effects method, taking into account heterogeneity and autocorrelation), while inclusive growth has the ability to reduce inequality, but during the course of the study, the implementation of macroeconomic policies, including government social expenditures, the ratio of bank credits to GDP, active labor participation, has not diminished inequality. Therefore, the findings of this model suggest the need to reform the macroeconomic policies in line with the decline in the growth of inequality.

All in all, according to the three models of this research, it can be stated that in both dynamic and static estimations, the growth of labor participation has been able to enhance the inclusive growth of the provinces.

Under these conditions, the growth of labor force participation has been accompanied by the reduction of absolute multi-dimensional poverty and inequality, which indicates that the opportunity and the possibility of participation in economic growth have been distributed unevenly, so that higher income deciles have contributed more to the growth process and benefited more from economic growth. The dynamic model, while solving the endogenous problem of models (1) and (2), reveals important information, such as the dependence of the dependent variable i.e inclusive growth and the growth of the inequality in the current period to the last year.

We examined the role of economic policies on the inclusive growth of the provinces and its impact on multidimensional poverty and income inequality.

After measuring the inclusive growth of Iran’s provinces based on the social mobility function, the inclusive growth of the provinces, as depicted in Figure 1, and with regard to the inclusive growth analysis of the provinces, it can be stated that the economic growth of the provinces of Iran has a low level of inclusiveness.

Inclusive growth has been volatile, and unsustainable, as the provinces of Iran have not been able to sustain economic growth. inclusive growth requires economic growth, but economic growth does not necessarily mean inclusive growth, because in these years, we have been experiencing economic growth, but with income inequality, so that the benefits of this growth are unevenly available only to high income deciles in these years and not distributed equally for all deciles.

The growth of inequality, as a discouragement, has caused this growth to be non-inclusive in the provinces, and even when the provincial inclusive growth happens, it is volatile and unstable.

The reason for this instability and fluctuation in the inclusive growth of the provinces is the dependence of Iran's economic growth on oil instead of the dependence of economic growth of the provinces on the active labor force participation of all income deciles, especially the lower income deciles of the society. Economic policies of the government, which include the growth of the ratio of bank credits to GDP, the social spending of the government, has been able to create inclusive growth in the provinces during periods of higher oil prices.

This inclusive growth, albeit unstable and volatile, growth has also been able to reduce poverty and inequality, which consistent with the findings of McCainley (2011), Lanchovichina and Landstrom (2009), and Sun and Kakwani (2008). Anand et al. (2014), Sabyasachi (2013) and Tzuqas (2013). However, as Sun (2007) evaluated the relationship between income inequality, poverty and inclusive growth in 43 developing countries during 1980 to 2004, in countries with high per capita income, the pursue of inclusive urban development policies has led to a reduction in inequality and poverty, while for low-income countries, this policy has not been accompanied by a reduction in income and poverty inequality.

This study shows that in Iran’s provinces the growth of the ratio of bank credit to GDP, the growth of government social expenditures failed to reduce poverty and inequality of provinces.

5- Concluding remarks

We examined the role of economic policies in inclusive growth, poverty reduction and inequality. The implementation of economic policies created inclusive growth in Iran’s provinces. Though it was unstable and volatile, it was able to reduce poverty and inequality. But the results indicate that the implementation of economic policies and government social expenditures did not directly reduce the poverty and inequality in Iran’s provinces.

The most important determinant of inclusive growth and the reduction of absolute multi-dimensional poverty in Iran’s provinces is the growth of active labor force participation in the provinces. Therefore, the promotion of the capacity of individuals, especially those who have not been able to participate in and benefit from economic growth, is a must. But the

increase of labor force participation has been accompanied by an increase in inequality, which indicate that, the opportunity and the possibility of participation in economic growth have been distributed unevenly, so that the high-income deciles are more involved in the economic growth process and benefited from it.

Financial deepening can also promote inclusiveness through policies that provide more access for poor people for financial services in Iran's provinces. Unequal access to financial markets can reduce revenues by preventing investment in physical and human capital. Meanwhile, inflation has also a negative and significant effect on the inclusive growth in Iran's provinces. Also, macro-financial stability has an important role in this regard. According to the results, it is suggested that policies should be designed to expand employment opportunities and access to social services and infrastructure to achieve inclusive growth, the reduction of multidimensional poverty and inequality in the provinces. By increasing investment in social expenditures, the government can boost people's ability to increase labor force participation in the provinces, and economic growth of the provinces, will lead to a stable growth. For inclusive growth, the promotion of microfinance institutions is needed to enhance financial inclusion, microfinance loans, and access to credit throughout the provinces for small and medium enterprises. More attention to the role of economic policies and social expenditures of the government is necessary, in order to sustain the inclusive growth.

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Appendix A

Table 14: Dimension and Indicators of Multi-Dimensional Poverty and its Criteria for Iran's Provinces

Dimensions	sub-indicators	deprivation if	alternative criterion
Education	number of years of education	No family member has five years of education.	The share of illiterate people over the age of 6to the population over the age of 6 years.
	Child attendance at school	Each of the children at the age of schooling who left the school up to the age of eight or have not attended school at all.	The share of people who do not attend school in any province, aged between 8 and 15 years old.
The health	child mortality	child dying within family.	Share of children under the age of 4 died to number of died people in the province
	food	malnutrition of any adult or child who needs to get a certain amount of food.	Deleted
Standard of living	electricity	household has no electricity.	Percentage of people in each province that do not have electricity.
	Safe drinking water	household does not have access to safe drinking water or there is an urgent need for more than 30 minutes to access safe drinking water.	Percentage of population not covered by drinking water network in any province.
	sewage drainage system	The household does not have sanitary or shared between several households .	Percentage of population not covered by urban sewage network in any province.
	Floor covering	Floor coverings of the home covered by sands.	Deleted
	Fuel for cooking	fuel for the cooking of households food is wood or coal.	The percentage of population that does not have access to the gas network in any province.
	Ownership of property	household does not have more than one radio, television, telephone, bicycle or motorcycle and the household does not own a car or tractor.	Deleted