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Government Size and Happiness Inequality: A Threshold Panel Approach

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Abstract

The purpose of this study is to examine the relationship between government size and happiness inequality in a number of developing and developed countries during the period of 2002-2015 by threshold panel approach. To obtain robust results, we have applied the model in the Iran's economy by time series data during the period of 1974-2016. The results in developing countries showed that in small governments, the government size had a diminutive effect on the inequality of happiness, but by passing the threshold and increasing the government's involvement in the economy, this variable had no significant effect on the happiness inequality. The same time series results were obtained for Iran's economy, which has a small government size. In this group, the government size has a significant negative impact on happiness inequality and after that, it has a significant positive impact on happiness inequality. Developed countries showed completely different results, whereby the size of the government had a significant positive impact on inequality in small governments but in large governments, it did not have a significant effect on the inequality of happiness.

1. Introduction

Since reducing different types of inequalities, in terms of factors such as income, gender, and happiness, is one of the most important objectives of policymakers in both developing and developed countries, it is necessary to identify factors affecting inequalities in society. This paper aims to shed light on the factors that affect happiness inequality. It particularly focuses on the impact of government size. Government size, and subsequently, the change in government expenditure can influence the inequality of happiness in society. Understanding the nature and the processes behind this impact can be extremely important for policymakers in both developed and developing countries since this awareness can help them to regulate the policies needed to reduce happiness inequality in different deciles of the society.

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Based on the previous studies that show the nonlinear effects of government size on economic variables — such as the economic growth (Armey, 1995; Barro, 1990; Abounoori and Nademi, 2010) and income inequality (Sylwester, 2002; Nademi and Hasanvand, 2015) — a linear impact of government size on happiness inequality seems plausible. That is to say, the size of the government will negatively affect the inequality of happiness as far as the government is small, but once the threshold is passed, the size of the government will have a positive impact on happiness inequality. The small size of the government can reduce the inequality of happiness in society through expenditures on education, entertainment, and sports, and by strengthening public goods, granting social security and unemployment benefits, and supporting the poor. But after excessive governmental intervention in the economy and an increase in the inefficiency of government expenditure, inequality of happiness in society increases due to economic renting activities, crowding out effects, monopoly and high competition restrictions in markets. All of these have negative effects on economic growth, social welfare, employment, income distribution, poverty, and inequality. Whether the effect of government size on happiness inequality is nonlinear or not is the main question this study tries to answer.

Also because of the differences in the economic structures and government performance in developed and developing countries, the study will explore the influence of government size on happiness inequality for developing and developed countries separately. Considering the gap in the literature on the impact of the government size on happiness inequality, this study can open new ways for further research in the field.

This paper is organized in six sections. In the next section, the theoretical framework is presented. In section 3, the literature is reviewed. Section 4 is devoted to the methodology and data description. Section 5 presents empirical results and in final section, the concluding remarks are presented.

2. Theoretical Framework

2.1 Government Size and Happiness Inequality

Afonso et al (2010) showed that public policies affect the distribution of national income in two forms: the direct form, where the effects are imposed through costs and taxes, and the indirect from, where impacts are imposed through income opportunities, human capital, and established institutions. Since income distribution inequality can affect happiness inequality, the size of the government will also affect the inequality of happiness. Public spending, in the direct form, alters the purchasing power of individuals with cash payments or support for their expenses. This comes in the form of food coupons, housing subsidies, social care for working mothers and their children. Consequently, subsidies and transitional payments affect the distribution of income and happiness as they affect various deciles and increase purchasing power. In addition to these direct effects, public expenditure has also significant indirect

effects on national income. Through productivity improvement and better employment opportunities, public expenditure can have significant effects on income distribution and happiness distribution. For example, an efficient public transportation system makes people able to find jobs with fewer travel expenses; or the increase in educational expenditure can increase human capital, benefit the poor, and distribute income and happiness. There are three decisive reasons that explain why governments have significantly increased their expenditure on education. First, the social efficiency of this policy is very high, and investment in this field leads to an increase in labor productivity, and consequently, an increase in national income and a decrease in income distribution inequality. Second, it has been observed that girls' education has had a negative effect on the fertility rate and a positive effect on the family health; hence, an effective factor in improving income distribution and distribution of happiness in society. Third, free access to health facilities keeps the workforce healthy, thereby increasing the workforce and their ability to earn money. In addition to what has been stated, the creation of efficient institutions that ensure law enforcement, justice and reduce corruption and violation of other individuals' rights are effective factors in improving income distribution and distribution of happiness. This is because when the law is not fair or enforced, poorer people are more likely to find fewer alternatives for their jobs, and have to pay higher rates to receive some services. What was said above explains why the activities or policies in the public sector have both direct and indirect effects over time on the distribution of income and happiness (Afonso et al., 2010; Nademi and Hasanvand, 2015).

Ott (2011) has discussed that the relation between good governance and inequality of happiness is not linear, but follows a bell shaped pattern, inequality of happiness being highest in nations where the quality of government is at a medium level. The relation between the size of government and average happiness depends heavily on the quality of government; good-big government adds to happiness but bad-big government does not.

Based on their type, composition, and extent, government expenditures can have different results on the purchasing power of various deciles. On one hand, they could lead to more benefits for the rich, finally leading to happiness inequality and uneven income distribution. On the other hand, especially with the increase in subsidies and government transitional payments to low-income deciles, a better income and happiness distribution will be achieved.

2.2 Other Effective Factors on Happiness Inequality

Inflation can decrease the level of happiness (Di Tella et. al, 2001, Monsef et. al, 2019) which that affect happiness inequality. Inflation increases income inequality (Sieroń, 2017 and Nademi, 2018) and increasing income inequality can increase happiness inequality (Oishi et. al, 2011, Jalili Kamju & Nademi, 2019). Increasing inflation deepens the happiness gap in society because inflation reduces the real income of the fixed income classes, which are mainly

low and middle-class, thus reducing the purchasing power of the middle and lower income classes. In the other hand, inflation is a return on fixed assets, rising inflation can increase real wealth and increase the return on assets of wealthy people. As a result, the purchasing power of wealthy people may be increased in inflationary terms. This exacerbates class distances and income inequality in society, while at the same time increasing inequality of happiness in society, since inflation reduces the satisfaction of fixed income groups and limits their purchasing power but it has also enabled higher purchasing power for the wealthy groups which they can spend it for their own happiness, like buying luxury goods (Nademi & Jalili Kamjoo, 2018).

Another important variable can affect happiness inequality is unemployment (Di Tella et. al, 2001, Nademi & Jalili Kamjoo, 2018). Unemployment can decrease the level of happiness (Monsef et. al, 2019) which can increase the gap of happiness between low and high income groups so it can increase the happiness inequality. As unemployment rises, more and more people in the community experience dissatisfaction and frustration, which in turn increases the dependency ration of lower- and middle-class households, and thus the purchasing power of these classes to spend on family happiness is virtually limited. Therefore, it would be highly probable that lowering the satisfaction and happiness of the lower and middle classes of the youth from unemployment and at the same time not greatly altering the happiness status of the wealthy classes would exacerbate the inequality of happiness. Another point about unemployment is that in addition to exacerbating the inequality of happiness for the above mentioned reasons, it reduces the level of happiness of the society because the crime also will be increased in the society and thus the sense of security will be decreased as a result of increasing in unemployment (Nademi & Jalili Kamjoo, 2018).

Income is one of the most important variables in happiness studies. Easterlin (1974) has discussed regarding the income-happiness nexus. He introduced a paradox between income and happiness in time series studies which indicates the U-inverse shape between income and happiness in long-run. However, this paradox has been criticized by many researchers that they indicate a positive relationship between income and happiness. Increasing income can decrease or increase happiness inequality depending on the situation of income inequality in the society. In a country with high income inequality, probably the increasing income increase the happiness inequality but in a society with low income inequality, increasing income probably decreases happiness inequality (Jalili Kamju & Nademi, 2019).

3. Review of Literature

The first comparison of happiness inequality was carried out in 1948 and covered nine countries (Buchanan and Cantril, 1953). Veenhoven (2005b) revealed that happiness inequality has a direct relationship with institutional conditions that are influenced by the political decisions of countries, and that

happiness inequality can cause social conflicts in the future. Factors affecting the levels of happiness depend on the levels of income, indicating inequality of happiness at different levels of income (Alois, 2014). In a cross-sectional study, Ott (2005) showed that the inequality of happiness is very different from the inequality of income. Social inequalities are not solely measurable through income inequality, and variables such as happiness inequality and longevity play a role in this process (Veenhoven, 2005a). The researches on happiness inequality were carried out by Chin-Hon-Foei (1989), Veenhoven (1990, 2000, 2002), Veenhoven and Ehrhardt (1995) and recently, Cummins (2003) and Fahey and Smyth (2003). Easterlin (1995) also assessed the relationship between economic growth and happiness inequality in European countries.

Clark et al. (2016) explored the impact of economic growth on happiness inequality in six different countries. The results showed that despite the U-inverse Kuznets relationship between income inequality and the economic growth, the inequality of happiness among these countries declined once the economy experienced growth, and no relationship between the economic growth and happiness was observed.

Dao (2017) has considered the importance and significance of government size on happiness in 183 countries during the period of 1990-2016 using panel data analysis. Dao (2017) has determined the indirect effects of government expenditure on happiness through the transmission channels include income, inequality, unemployment rate, inflation rate, economic growth and social development. Dao (2017) has found that government expenditure only affects happiness in short term and that the importance and direction of the transmission channels are heterogeneous.

Nademi and Jalili Kamju (2018) examined the effect of absolute poverty on happiness inequality and investigated the effect of absolute poverty on the inequality of happiness in Iran during the 1979-2012 period. The results showed that absolute and relative poverty had a significant positive effect on happiness inequality in Iran. In another study in Iran, Jalili Kamju and Nademi (2019) have evaluated the effect of income inequality on happiness inequality in Iran using a threshold regression method during the period of 1973-2014. They showed that income inequality has a nonlinear and threshold impact on happiness inequality. In other word, when Gini coefficient is less than 0.416, an increase in income inequality has a significant negative impact on happiness inequality. However, after the threshold point, an increase in income inequality has a significant positive impact on happiness inequality.

Fattahi, et al (2019) have considered the relationship between the average of happiness and inequality of happiness in MENA countries during the period of 2006-2017. They indicated that there is a positive linear relationship between the average of happiness and inequality of happiness in these countries.

The literature review indicates there is no study to consider the impact of government size on happiness inequality in both developing and developed

countries. So, our contribution is considering the relationship in both developing and developed countries.

4. Methodology and Data

The methodology of this study is based on econometrics. Accordingly, based on theoretical literature and previous studies, the econometric model was defined in order to answer the research questions, and then decisions about the research hypotheses were made using inferential methods.

4.1 Threshold Panel Model

In order to investigate the effect of government size on the inequality of happiness in sample countries, a model was defined using theoretical literature:

$$HapInequality_{it} = f\ (GS_{it}.Income_{it}.Inf_{it}.Un_{it}) + \varepsilon_{it} \quad (1)$$

Where $HapInequality_{it}$ is the inequality of happiness, GS_{it} is government size or the proportion of government expenditure to the gross domestic product, $Income_{it}$ is per capita income, Inf_{it} is the inflation rate, Un_{it} is the unemployment rate, and ε_{it} is error term.

Since this study hypothesizes that the effect of government size on happiness inequality is nonlinear, the experimental model was defined as a threshold model[1]:

$$\begin{aligned} HapInequality_{it} &= \beta_0 + \beta_1 Income_{it} + \beta_2 Inf_{it} + \beta_3 Un_{it} \\ &+ A[GS_{it} \le \gamma] * \beta_4 GS_{it} + A[GS_{it} > \gamma] * (\beta_5 + \beta_6 GS_{it}) + \varepsilon_t \\ A[GS_{it} > \gamma] &= 1 \qquad if \qquad [GS_{it} > \gamma] \\ A[GS_{it} \le \gamma] &= 1 \qquad if \qquad [GS_{it} \le \gamma] \end{aligned} \quad (2)$$

Equation (2) shows a panel threshold regression in which GS_{it} is the threshold variable and γ is the threshold value of government size that should be estimated. This threshold value is obtained by following Hansen's (1999) method based on minimizing the residual sum of squares (RSS) of Equation (2) for different values of threshold variables. In other words, the optimal threshold is the threshold value that has minimum RSS. If this calculated threshold is significant, it will be used to estimate the model. Hansen's bootstrapping method (1996, 1999 and 2000) will be used to investigate the significance of this threshold.

The null hypothesis for equation (2) means that there is no threshold, and the model is linear. On the opposite, the existence of a threshold, and consequently, the existence of a nonlinear model is hypothesized.

Hansen's bootstrapping method (1992, 1999), which was proposed for approximating the asymptotic distribution of test statistics, was used in this study. The bootstrapping method was performed as follows:

A. In the first step, a sample of random numbers with mean zero and variance 1 was created, $\eta_t = NID(0.1)$ and $X_t^* = \hat{e}_t \eta_t$ was introduced and defined.

[1] We have tested the possibility of two threshold value but it had not significant.

B. In order to calculate the constraint sum of squared residuals (S_0), the variable X_t^* was regressed on $\beta_0 + \beta_1 Income_{it} + \beta_2 Inf_{it} + \beta_3 Un_{it}$.

C. In order to obtain the non-constraint sum of squared residuals ($S_1(\hat{\gamma})$), the variable X_t^* was regressed on $\beta_0 + \beta_1 Income_{it} + \beta_2 Inf_{it} + \beta_3 Un_{it} + A[GS_{it} \leq \gamma] * \beta_4 GS_{it} + A[GS_{it} > \gamma] * (\beta_5 + \beta_6 GS_{it})$.

D. The $w^*(\gamma) = \frac{T(S_0 - S_1(\hat{\gamma}))}{S_1(\hat{\gamma})}$ was calculated, in which T is the number of observations and $W^* = \sup W^*(\gamma)$.

E. The above steps should have been repeated B times and the computational statistics corresponding to B repetition has been shown with w_b^*. The P-value for w was obtained as follows:

$$p - value = (1/B) * \sum_{b=1}^{B} L\,(W_b^* > w) \quad (3)$$

After performing the above-mentioned process, repeating it, and obtaining the desired statistics, the null hypothesis of linearity was tested.

Regarding data collection, the index of happiness inequality was obtained based on happiness questionnaires from global studies of Chin-Hon-Foei (1989), Veenhoven (1990, 2000, 2002), Veenhoven and Ehrhardt (1995), Veenhoven and Kalmijn (2005), Cummins (2003), and Fahey and Smyth (2003) on 116 countries over the past decades, sponsored by Erasmus University of the Netherlands. Happiness inequality index is calculated based on calculated deviations from the information obtained from happiness questionnaires to measure happiness level. The data is available on the website of Global Report of Happiness. Government size was derived from the ratio of government expenditures (government consumption expenditures) to gross domestic product. Per capita income was derived from the ratio of national income to population, and inflation was calculated based on the growth of the consumer price index (CPI). Finally, the unemployment rate was obtained by the number of unemployed people in relation to the active population. Government size, per capita income, inflation, and unemployment data were extracted from World Development Indicators (WDI) data set. Table 1 and 2 indicate descriptive statistics of the variables in developing and developed countries respectively.

Table 1. Descriptive Statistics of Variables in Developing Countries

Variable	Mean	Max	Min	St.Dev
GS	14.73	30.003	2.04	4.61
Happiness Inequality	1.94	3.12	0.19	0.34
Inflation	6.06	254.9	-10.06	10.31
Unemployment	8.10	37.2	0.16	5.77
Per Capita Income	6745.7	49588.7	271.02	7684.1
Correlation between GS and Happiness Inequality			0.061	

***Source**: Research Calculation*

Table 2. Descriptive Statistics of Variables in Developed Countries

Variable	Mean	Max	Min	St.Dev
GS	19.62	27.93	10.90	3.88
Happiness Inequality	1.76	2.22	1.02	0.21
Inflation	1.64	4.89	-4.47	1.25
Unemployment	6.89	26.09	2.55	3.47
Per Capita Income	49225.77	111968.3	16734.85	17032.05
Correlation between GS and Happiness Inequality			-0.517Tt	

***Source**: Research Calculation*

For more consideration regarding Iran's economy, we have estimated the equation (2) for Iran by time series data during the period of 1974-2016. The data of explanatory variables have been collected from the central bank of Iran. Also, the data of inequality of happiness extracted from the study of Nademi and Jalili Kamjoo (2018) which has updated until 2016 by a simple trend.

5. Empirical Results

Before estimating the model, the model variables were required to be tested in terms of stationarity. In the panel data, before testing unit root, it is suggested to test cross section dependence test to recognize the dependency between cross sections. Table 3 shows the results of the Pesaran cross-section dependence test and the results indicate the dependency between cross sections in all variables in both developing and developed countries.

Finally, the PP - Fisher Chi-square and Levin, Lin & Chu's unit root tests were used. The results of these tests are presented in Tables 4 and 5.

Table 3. Cross-Section Dependence Test

Variable	Pesaran CD Test For Developing Countries	Pesaran CD Test For Developed Countries
	P-Value	P-Value
Happiness inequality	0.00	0.00
Government Size	0.00	0.00
Per capita income	0.00	0.00
Inflation	0.00	0.00
Unemployment	0.00	0.00

***Source**: Research Estimation*

Table 4. The unit-root tests of the model variables for developing countries

Variable	The Levine, Lin and Chu's test (With Intercept)	the PP - Fisher Chi-square (With Intercept)	Test Result
	P-Value	P-Value	
Happiness inequality	0.00	0.00	Stationary
Government Size	0.00	0.00	Stationary
Per capita income	0.00	0.00	Stationary
Inflation	0.00	0.00	Stationary
Unemployment	0.00	0.00	Stationary

***Source**: Research Estimation*

Table 5. The unit-root tests of the model variables for developed countries

Variable	The Levine, Lin and Chu's test (With Intercept)	PP - Fisher Chi-square (With Intercept)	Test Result
	P-Value	P-Value	
Happiness inequality	0.00	0.00	Stationary
Government Size	0.00	0.00	Stationary
Per capita income	0.00	0.00	Stationary
Inflation	0.00	0.00	Stationary
Unemployment	0.00	0.00	Stationary

***Source**: Research Estimation*

Table 6. The unit-root tests of the model variables for Iran's economy (time series data)

Variable	ADF Test (With Intercept)	Zivot Andrews Test (With Intercept)	Test Result
	P-Value	P-Value	
Happiness inequality	0.30	0.01	Stationary
Government Size	0.07	0.00	Stationary
Per capita income (Logarithm)	0.36	0.00	Stationary
Inflation	0.00	0.01	Stationary
Unemployment	0.02	0.04	Stationary

***Source**: Research Estimation*

Tables 4 and 5 indicate that all variables are stationary at a 5% significance level. Also, for testing unit root in time series data of Iran's economy, firstly, we have used the ADF test which the results in Table 3 indicate three variables including happiness inequality, government size and per capita income are non-stationary. Then, because of many structural break in Iran's economy like revolution, war, sanctions and oil shocks, it is necessary to apply a unit root test with assumption of structural break. So, we have used the Zivot Andrews test to capture the structural break in unit root test. The results of the Zivot Andrews test in Table 6 indicate that all variables are stationary. Therefore, it is possible to estimate the model without being trapped in a spurious regression. Below, we estimated the threshold models.

5.1 The Empirical Results of Threshold Panel Models for Developing and Developed Countries

Tables 7, 8 and 9 show the estimation results of the models for the sample countries. The estimation results of the model can be summarized as follows:

1. The government size in both developing and developing countries had a threshold and nonlinear impact on happiness inequality. However, some interesting differences were also observed. In the developing countries having small government size or having the government size of less than

8.39%, the size of the government had a significant negative effect on happiness inequality. Whereas in governments with a big size or the size of greater than 8.39%, the government size did not have a significant effect on happiness inequality. The same time series results with the threshold value of 13% have obtained for Iran's economy which before this threshold value, the government size has a significant negative impact on happiness inequality and after that, it has a significant positive impact on happiness inequality. But the results in developed countries were quite different so much so that the threshold of the government size was estimated to be 22.8%. In these countries, the small size of the government or sizes smaller than 22.8 % had a significant positive effect on happiness inequality, but bigger sizes or sizes greater than 22.8% had not a significantly impact on the inequality of happiness. Thus, the difference between the results in developing and developed countries reveals that as the role of governments in the economy of developing countries increases, the positive role of a small government in reducing the inequality of happiness vanishes. On the other hand, an increase in the size of the government in these countries neutralizes the positive effect of government size on the inequality of happiness. Whereas, in developed countries, the big size of the government and possibly moving towards welfare government reduce the inequality of happiness in society and it neutralizes the positive effect of government size on the inequality of happiness. The increasing effect of government size on happiness inequality in small-size governments in developed countries can be due to the fact that economic growth is prioritized over the reduction of inequalities. Having achieved economic growth and increased the revenues of the society and government, governments adopt policies to reduce different kinds of inequalities, including happiness inequality. Hence, it can be concluded that the development of big-size governments in developed countries will ultimately lead to the more equal distribution of happiness in society, which indicates the effectiveness of government policies in these countries. On the contrary, in developing countries, big-size governments mean lack of efficiency in reducing inequalities, which can be due to factors such as economic rents and government corruption.

Table 7. Estimation Results in Developing Countries[1]

Variable	Coefficient	P-Value
Threshold Value of Government Size	8.39%	0.00
Intercept in Small Government Size Regime	1.23	0.00
Intercept in Big Government Size Regime	1.10	0.02
Government Size in Small Government Size Regime	-0.02	0.01
Government Size in Big Government Size Regime	0.001	0.45
Per Capita Income	0.10	0.00
Unemployment	0.003	0.01
Inflation	-0.002	0.00
Panel Cross-section Heteroskedasticity LR Test (P-value)	0.56	R^2 89%

***Source**: Research Estimation*
***Note**: In estimation the cross section weighs have been used to deal with heteroscedasticity.*

Table 8. Estimation Results in Developed Countries

Variable	Coefficient	P-Value
Threshold Value of Government Size	22.8%	0.00
Interception in Small Government Size Regime	-1.28	0.04
Interception in Big Government Size Regime	-0.50	0.04
Government Size in Small Government Size Regime	0.018	0.01
Government Size in Big Government Size Regime	-0.009	0.39
Per Capita Income	0.24	0.00
Unemployment	0.01	0.00
Inflation	-0.01	0.00
Panel Cross-section Heteroskedasticity LR Test (P-value)	0.34	R^2 81%

***Source**: Research Estimation*
***Note**: In estimation the cross section weighs have been used to deal with heteroscedasticity.*

Table 9. Estimation Results in Iran's Economy

Variable	Coefficient	P-Value
Threshold Value of Government Size	13%	0.00
Interception in Small Government Size Regime	2.46	0.00
Interception in Big Government Size Regime	1.88	0.01
Government Size in Small Government Size Regime	-6.04	0.00
Government Size in Big Government Size Regime	0.587	0.00
Per Capita Income	-0.07	0.28
Unemployment	0.02	0.06
Inflation	-0.03	0.86
R^2	63%	

***Source**: Research Estimation*

Table 10. Results of Hansen's Bootstrapping Test

Model	Estimated Threshold	P-Value	Test Results
Developed Countries	22.8%	0.00	significant threshold
Developing Countries	8.39%	0.00	significant threshold
Time Series for Iran's Economy	13%	0.00	significant threshold

***Source**: Research Estimation*

[1] The developing and developed countries have been selected according to Human Development Index (HDI).

Furthermore, the results of Hansen's bootstrapping test for threshold significance in Table 10 show that the threshold of the government size is statistically significant for both panel and time series models. As a result, the threshold method has priority over the linear method in the model estimation.

2. In panel models, per capita income had a significantly positive influence on happiness inequality in both developing and developed countries. This results could be a result of income inequality in the countries. In fact, the increase in per capita income leads to the promotion of happiness inequality in these countries. These results are consistent with the study of Graafland and Lous (2019) that indicates the importance of income inequality in happiness inequality.

   In time series model for Iran's economy, per capita income has not significant impact on happiness inequality. This result could be described by income inequality and the situation of rent distribution in Iran.

3. The increase in the unemployment rate leads to an increase in the inequality of happiness in both developed and developing countries. This result also is true for Iran's economy in large government size regime. This is because higher unemployment rates cause individuals and their families to suffer, and the level of happiness to decrease in society at large and all deciles thereof. This effect was the same for both developing and developed countries. These results are consistent with the findings of Nademi and Jalili (2018) and Jalili and Nademi (2019).

4. Inflation rate did not significantly affect happiness inequality in developing countries including Iran's economy, but it led to lower levels of happiness inequality in developed countries. The latter case is due to the lower inflation rate in developed countries. Very low inflation rates could be an incentive for the promotion of production, economic growth, and employment, leading to the reduction of happiness inequality. On the other hand, this relationship was not significant in the case of developing countries since high inflation rates in some developing countries neutralized the positive effects of lower inflation rates in other developing counties, leading to the insignificant effect of inflation on happiness inequality in these countries. These results are different with the studies of Nademi and Jalili (2018) and Jalili and Nademi (2019).

6. Conclusion

In this study, the relationship between government size and happiness inequality in a number of developing and developed countries was evaluated over the period 2002-2015. Also, for more consideration, we have investigated the government size-happiness inequality nexus in Iran's economy by time series data during the period of 1974-2016. The study based its hypothesis on

the nonlinearity and threshold effect of government size on happiness inequality in these countries. Using theoretical literature and research background, the factors influencing the happiness inequality were modeled based on econometric methodology. The threshold regression was used, and the model was estimated once stationary of variables was determined. The results of the model estimation showed that the government size had a threshold effect on happiness inequality. In other words, before the threshold of 8.39% in government size in developing countries, the government size has a diminutive effect on happiness inequality, but this variable has an insignificant effect on happiness inequality after the threshold is crossed and the government's involvement in the economy is increased. The same time series results with the threshold value of 13% have obtained for Iran's economy which before this threshold value, the government size has a significant impact on happiness inequality and after that, it has a significant positive impact on happiness inequality. Developed countries, however, showed totally different results: in small-size governments, or in cases where the government size is less than 22.8%, the government size has a significant positive impact on happiness inequality. However, in large-size governments, or in cases where the government size is larger than 22.8%, the government size has not a significant effect on happiness inequality.

The results also showed that per capita income in developing countries has a positive and significant effect on happiness inequality, while per capita income in developed countries has a negative and significant impact on happiness inequality. In time series model for Iran's economy, per capita income has not a significant impact on happiness inequality.

In addition, rising unemployment rates in both developed and developing countries including Iran will increase happiness inequality. Also, the inflation rate in developing countries and specifically in Iran's economy does not have a significant effect on happiness inequality, but it reduces happiness inequality in developed countries.

Based on the results of the research, it is recommended that policymakers, while implementing their policies, pay attention to the threshold effect of government size on happiness inequality. This way, politicians can orient government spending in a way that reduces happiness inequality in society.

Because of the importance of governing institutions in Iran's economy and its effects on government size and happiness inequality, we suggest researchers consider the role of these institutions on government size and happiness inequality in future studies.

Also, considering the worse impact of unemployment than inflation on happiness inequality in both developing and developed countries, it is suggested that if there is a reverse relationship between inflation and short-term unemployment (Philips Curve), policy makers should reduce unemployment rather than decreasing inflation.

In future studies, we suggest researchers consider the relationship between happiness inequality and health and educational expenditures.

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Appendix

The Estimation Results

Dependent Variable: HAPINEQUALITY
Method: Panel EGLS (Cross-section weights)
Date: 02/03/20 Time: 20:56
Sample: 2002 2017
Periods included: 16
Cross-sections included: 80
Total panel (balanced) observations: 1280
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.238225	0.145518	8.509102	0.0000
(GS<=8.39999999999999)*GS	-0.020119	0.007795	-2.580894	0.0100
UN	0.003210	0.001308	2.453497	0.0143
INF	-0.002070	0.000512	-4.043506	0.0001
LSARN	0.101454	0.015169	6.688410	0.0000
(GS>8.39999999999999)*GS	0.001098	0.001482	0.740695	0.4590
(GS>8.39999999999999)*DUM	-0.134965	0.060811	-2.219417	0.0266

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.892363	Mean dependent var	3.006651
Adjusted R-squared	0.884701	S.D. dependent var	1.810552
S.E. of regression	0.167125	Sum squared resid	33.34953
F-statistic	116.4573	Durbin-Watson stat	0.927079
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.754547	Mean dependent var	1.962000
Sum squared resid	33.78527	Durbin-Watson stat	0.748052

Dependent Variable: HAPINEQUAL
Method: Panel EGLS (Cross-section weights)
Date: 02/03/20 Time: 19:50
Sample: 2002 2017
Periods included: 16
Cross-sections included: 18
Total panel (balanced) observations: 288
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.287806	0.647493	-1.988911	0.0477
(GS<=22.80000000000009)*GS	0.018143	0.007621	2.380649	0.0180
UN	0.010960	0.001605	6.826964	0.0000
INF	-0.012542	0.004014	-3.124723	0.0020
LSARN	0.240964	0.063631	3.786926	0.0002
(GS>22.80000000000009)*GS	-0.009338	0.010919	-0.855164	0.3932
(GS>22.80000000000009)*DUM	0.786762	0.217256	3.621354	0.0004

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.819053	Mean dependent var	2.274812
Adjusted R-squared	0.803288	S.D. dependent var	1.097576
S.E. of regression	0.101888	Sum squared resid	2.740616
F-statistic	51.95600	Durbin-Watson stat	1.124333
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.786541	Mean dependent var	1.740104
Sum squared resid	2.903197	Durbin-Watson stat	1.000872

Dependent Variable: HAPINEQULITY
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 01/15/20 Time: 18:30
Sample (adjusted): 1353 1395
Included observations: 43 after adjustments
HAPINEQULITY=C(1) + C(2)*INF+C(3)*UN+C(4)*LOG(YP)+C(5)*GSC
+(GSC>0.1300000000000002)*(C(6) + C(10)*GSC)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	2.461309	0.444243	5.540450	0.0000
C(2)	-0.033223	0.199191	-0.166791	0.8685
C(3)	0.027543	0.014657	1.879137	0.0683
C(4)	-0.076042	0.069976	-1.086674	0.2844
C(5)	-6.048521	1.581308	-3.825011	0.0005
C(6)	-0.578376	0.228907	-2.526687	0.0161
C(10)	6.635990	1.802829	3.680875	0.0008

R-squared	0.639052	Mean dependent var	1.997501
Adjusted R-squared	0.578893	S.D. dependent var	0.155331
S.E. of regression	0.100798	Akaike info criterion	-1.603492
Sum squared resid	0.365770	Schwarz criterion	-1.316785
Log likelihood	41.47508	Hannan-Quinn criter.	-1.497763
F-statistic	10.62287	Durbin-Watson stat	1.466689
Prob(F-statistic)	0.000001		