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The Effect of Demographic Variables on Happiness

Esmaiel Abounoori [1] **Morvarid Shariati Ashrafi**[2]

[1] Professor of Econometrics & Social Statistics, Semnan University, Semnan-Iran, Esmaiel.abounoori@semnan.ac.ir
[2] MA of Economics, Semnan University, Semnan-Iran, morvarid.shariati95@gmail.com

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Abstract:
Happiness is the main goal and the pursuit of happiness is inherent in human nature. The main aim of this study has been to estimate the effects of demographic variables, such as Fertility rate, Marriage rate, and Divorce rate on Happiness. The GDP per capita, Inflation and Unemployment are used as the control variables. In order to estimate the effects, we have used panel data including 21 selected countries with different characteristics (Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Japan, Latvia, Lithuania, Luxemburg, Mexico, Netherlands, Poland, Slovenia, Sweden, Turkey, United States, Romania, and Iran), for the period 2008 to 2017 are used. Concerning the F-Limer (Chow) and the Husman tests, the fixed panel Approach is used. The estimations results using panel methods with fixed effects indicates that the effects of fertility rate and GDP per capita on happiness are positive, but the effects of divorce rate and unemployment on happiness are significant and negative. The effect of inflation is positive and the effect of marriage rate is negative, but neither is significant.

1. Introduction

Microeconomics attempts to answer two questions: first, how does a person assign their limited resources, such as budget and time, among various goods and services to achieve their goal of maximizing utility? Second, how does a firm or organization use its limited resources by hiring means of production to achieve its goal of maximizing output or profit? So, according to the basic principles of microeconomics, at the individual

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level, people strive for maximum desirability. Achieving maximum desirability is a manifestation of the concept of happiness, (Dickey, 1999). In the late twentieth century, the issue of happiness became one of the most important topics studied by sociologists, psychologists and economists. According Myers (2002), it can be concluded that the ultimate goal in economics is to increase well-being, life satisfaction and happiness. Research shows that happiness can improve physical health. Happy people feel more peace, have a participative mind, can make decisions more easily, and are more satisfied with their environment. Happiness economics has taken a new direction in economics based on a more realistic view of profit maximization and utility. It has also succeeded in creating an interaction between tangible and intangible effects in deciding economic behavior.

Since 2000, the United Nations has included the variables of happiness and hope for the future, as well as the satisfaction of individuals in society, as key variables in the calculations of the development of countries. This means that a society whose members do not feel satisfied, cheerful and happy cannot be develop (Azizi and Homayouni, 2009; cited by Fattahi et al., 2016).

It is not easy to identify the factors that influence happiness. Happiness is a type of emotion that encompasses a wide range of physiological responses, from feeling relaxed to feeling happy. Positive psychology has dealt with happiness, among other things. Happiness has a significant impact on human personality formation and mental health, which is why it has taken a special place in the field of mental health in recent years. Many researchers in the field of depression, including Martin Silgman, believe that it is better to focus on happiness rather than just treating depression. To describe some of the factors that influence happiness, Diener et al. (1985) mentions personality traits and self-esteem, heredity, kinship factors, environmental and cultural factors, religious beliefs, interpersonal relationships, marriage, social capital, economic status, job satisfaction, enjoyment and leisure. In the new texts, the terms wealth, happiness and life satisfaction are often used instead of the others and life satisfaction has been used in most of the studies on happiness, inflation and unemployment (Ruprah, 2011). Life satisfaction is the result of a comparison between a person's realized goals and his ideal and unattainable goals. Life satisfaction encompasses all aspects of human life, including social, moral, economic, etc., and is not limited to satisfaction

with a particular situation or condition. (Arsalan et al., 2010). Life satisfaction has two perspectives: mental and objective. Life satisfaction from a mental perspective means that a person perceives satisfaction with various aspects of life such as family, friends, and environment, as well as people's reports of their physical health. Life satisfaction from an objective perspective means controlling external conditions such as people in the environment and friends, income, puberty crisis issues, quality of life and the like. (Huebner, 2004).

Health is a multidimensional concept that includes happiness and well-being in addition to not being sick. Also, it should be noted that the indicators of happiness and life satisfaction have mental scales and depend on the mindset of the individual, but happiness has an objective aspect that is not dependent on personal opinions. The mental aspect of happiness is less accurate than the objective aspect (Li and Lu - 2009). But the mental aspect has two advantages over the objective aspect. 1. conducting objective measures of happiness is not economically feasible. 2. Happiness measures are effective in orienting the appearance of society, which provides a basis for mental measures. Whether people are happy or not cannot be determined by fixed rules alone, because some of the emotions of people in social spaces are adjusted.

Increasing each of the variables marriage rate, fertility rate, and GDP per capita has a positive effect on happiness. In contrast, the effect of each of the variables divorce rate, inflation, and unemployment on happiness is negative.

Considering the importance of the happiness issue and the impact of changes in demographic variables on happiness, this study analyzed panel data from 21 selected countries including Iran for the period 2008 to 2017. These 21 countries were selected from the countries where the statistical data of all selected variables were available. This article is divided into five sections. The second part contains the research background. The third section contains the research method, that includes model specification and data collection, organization, and description. The fourth section presents the effect of changes in demographic variables on happiness for each variable separately. The fifth section is devoted to conclusions and suggestions.

2. Literature Review

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eeee lla et a.. 0000,,, in a ddddy eiii lled "Maceeeciiiii i aa sssssss s, examined a random sample of happiness data from 26,668 individuals in the United States and happiness and life satisfaction data from 105,270 individuals in twelve European countries over the same period. They examined the period from 1970 to 1990, hypothesizing that life satisfaction is a function of macroeconomic variables such as unemployment, GDP per capita, and inflation. Using microeconomics, they estimated the equation. Then, they used this information to analyze country panel data. The results show that social welfare is a function of reducing inflation and unemployment. It also shows that people who are unemployed have lower welfare and people with higher incomes are happier. It can also be said that men, widows, divorcees, unmarried people and people with low education have lower happiness levels. Easterlin (2005) wrote in an article in response to Veenhoven and Hagerty that the reason for their discrepant results is using incomplete data for developing countries and the trend of happiness is not increasing in all countries. He also pointed out that Japan still has a low level of happiness despite its high economic growth in the years studied.

DiTella, MacCulloch (2008) in a study titled Gross National Happiness in Response to Sterling Paradox, the Effect of Income on Happiness Using Panel Data for About 35,000 People in 12 OECD Countries Over 23 They estimated the year from 1975 to 1997. This estimate shows it is very likely that people become happy with the increase in their income level.

Nowok et al (2013) conducted a study to investigate whether people who migrate to the UK become happier after the move and whether the effect is permanent or temporary. Using life satisfaction responses from 12 waves of UK home pages and using a fixed effects model, the temporal pattern of immigrants' psychological well-being around the time of the migration event was extracted. The results show that, on average, the pre-immigration period is the time when people experience a significant decline in happiness. The increase in happiness due to immigration seems to have brought people back to their original level of happiness. In contrast to the results of labor market migration, the results of the temporal pattern of immigrants' psychological well-being do not differ significantly between men and women. The study also concludes that long-distance migrants are at least as happy as short-distance migrants, despite their high social costs.

Frey and Gallus (2013) conducted research in a technocratic manner. They stated that the government has a duty to increase the mental well-being of people, which can be measured by the National Happiness Index. They also believe that governments have the means to manipulate the index. Agan et al (2016) examined the impact of key macroeconomic variables on happiness. The study looked at 57 countries from 2005 to 2008 and used cross-country data instead of individual data. The results show that unemployment and inflation have a very strong negative impact on happiness at the macro level. Per capita income also has a positive effect on happiness.

Abounoori and Asgarizadeh (2010) studied the relationship between happiness and communication and information technology on economic growth. The study used panel data on happiness, information and communication technology expenditure and economic growth in 57 countries (due to information constraints) from 2003 to 2008. Initially, the relationship between happiness indicators and information and communication technology and economic growth became positive and significant for developing countries. Continuing the study, the variable of gender inequality was used as a factor affecting economic growth and as an auxiliary variable to adjust the equation of happiness and economic growth simultaneously using the two-step least squares method. The results showed positive coefficients for all countries and a higher level of significance for developing countries. Thus, there is a causal relationship between happiness and economic growth.

Afshari and Dehmardeh (2014) conducted a study to examine the effects of three variables poverty, income inequality and human development index on happiness during the period 2005 to 2012. The data used in this study are in the form of panels and 100 countries including developed and developing countries were examined. The estimation results in both groups show that poverty has a negative effect on happiness and better income distribution has a positive effect on happiness. Also, the relationship between human development and happiness in general and by country is positive and it is noteworthy that poverty and income inequality and human development play an important role in happiness, especially in developing countries.

Abounoori and Eskandari (2016) conducted a study to investigate the impact of inflation and unemployment on happiness in EU member states and Iran. This study covers the years 2001 to 2011 and fixed effects panel data were examined and it was found that unemployment and inflation have a negative and significant impact on happiness.

All studies at home and abroad have shown that many factors influence happiness, both at the individual and societal level. At the individual level, much emphasis has been laid on various issues like health, marriage, religious beliefs, consumption, education and literacy and at the societal level, emphasis has been laid on various social and economic issues like inflation, unemployment, wealth and economic growth, justice and equity in distribution of income, employment, economic freedom and government expenditure.

Population issue has always been one of the most important issues to be addressed both in developed and developing countries, like Iran. Developed countries are always facing the problem of population shortage and lack of indigenous labor force, and countries like Iran are always concerned about demographic variables such as marriage rate, divorce rate, fertility rate, and GDP per capita due to their sensitive geographical location in the Middle East, therefore, considering the importance and crucial role of these variables in all aspects of the countries, including the economy, as well as the importance of the happiness issue, it is very important and necessary to combine these two issues and study the impact of these two categories on each other, hence, due to the high sensitivity of these two categories of variables, it was decided to investigate the impact of changes in demographic variables on happiness.

The purpose of this study was to examine the effects of changes in demographic variables on happiness. The demographic variables studied are GDP per capita, fertility rate, marriage rate, divorce rate, inflation and unemployment. In this study, the impact of changes in each of these factors on happiness is assessed in a comprehensive and holistic manner.

3. Method of Research

3.1. Data Description

This study examined 21 countries with different characteristics such as Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Japan, Latvia, Lithuania, Luxemburg, Mexico, Netherlands, Poland, Slovenia, Sweden, Turkey, United States, Romania, and Iran around the world from 2008 to 2017. Happiness data for this study was taken from the Global Happiness Data Site. Other variables include GDP per capita, fertility rate, inflation, and unemployment, which were taken from the World Bank database, and marriage rate and divorce rate, which we took from the OECD website. Since Iranian marriage and divorce rates cannot be found on the OECD website, the statistics on the number of marriages and divorces in Iran were taken from the National Registry Office website and calculated and used manually per 1,000 people.

The variables used in this research are as follows: Gross domestic product represents the total monetary value of all final goods and services produced in a country in a given period of time (usually a year). GDP per capita is a measure of a country's economic output, obtained by dividing the country's GDP by the country's total population. The GDP per capita figures used in this study are in US dollars.

Fertility rate is the most important factor that changes the volume, growth rate and population structure in a society, therefore, monitoring and measuring this index is extremely important. Fertility rate in this study was calculated as births per woman.

Marriage is an important cycle that directly affects fertility and indirectly affects many social, economic and demographic characteristics. Marriage rate is one of the valid and useful demographic variables to study. Marriage rate is calculated per thousand people in this study.

Divorce is a kind of social harm based on the factors affecting divorce rather than the phenomenon of divorce itself, therefore, divorce is one of the most important sociological issues. In this study, the divorce rate is calculated per thousand people.

Inflation means an increase in the general level of prices over a period of time. We can consider inflation as an uncontrollable, unsupported and unplanned increase in the prices of goods and services that leads to a decrease in purchasing power and disturbs the balance between the liquidity available for the purchase of goods and services and the demand for goods and services. The figures used in this study refer to consumer price inflation.

Unemployment is one of the undesirable social phenomena that has negative consequences. The unemployment rate is obtained by dividing the unemployed population by the total active population multiplied by 100 and expressed as a percentage. Children and the elderly are not part of the active population because they cannot work. Students who are not looking for work, housewives, and all those who are not in the labor force despite having sufficient income are not considered to be in the labor force.

Happiness is a dependent variable in this study. Happiness is a state of mind that results from the satisfaction of human wants and needs. The manifestation of a feeling of happiness in a person increases motivation and mental energy as well as physical strength. According to Plato, the elements of human existence are divided into three categories: the power of reason or thought, emotions, and desires. Plato defines happiness as a state in which these three elements are in balance and harmony (Dickey, 1999). According to Aristotle, happiness is a life with spirituality.

The variables of life satisfaction and happiness are qualitative variables. Qualitative variable adjectives fall into two categories: Rank and Nominal (Abunouri, 2008: 15). A qualitative variable attribute is a rank attribute that can be lowered or raised on an axis (in a dimension). A nominal qualitative attribute is an attribute that cannot be sorted down or up on an axis. As we noted in the Winhoon et al. questionnaire, both life satisfaction and happiness are qualitative variables because they can be classified as very happy, happy, neither happy nor sad, sad, and very sad (Abounoori and Asgarizadeh, 1389: 29). In this study, we collected happiness data for 21 countries in the world, including Iran, during 2008-2017 from the database of happiness. These data were collected and compiled by publishing a questionnaire by Winhoon et al. The method of obtaining this data consists of statistical surveys to assess the life satisfaction and personal happiness of people living in each of these countries. This questionnaire contains questions that examine how happy

and satisfied the person feels with life in general and considering all life circumstances. Each question is scored as follows with a score from 1-5, respectively: Very happy, Happy, neither happy nor sad, *Upset, and* Very upset.

In other words, Veenhoven transformed the attribute of the qualitative variable rank into an attribute of the quantitative variable in order to make a more accurate and correct evaluation in his studies. The attribute of a quantitative variable includes two categories: continuous and discontinuous (Abu Nouri, 2007). A slightly continuous variable attribute is an attribute that can be measured with real numbers. But the attribute of a slightly discontinuous variable can only be counted with integers, thus, we conclude that Veenhoven et al. have transformed the happiness variable into a quantitative continuous variable. These data are scored on a scale from 1 to 4 as well as from 1 to 10. The scale used in this dissertation ranges from 1 to 10, with a value of 1 indicating the minimum level of happiness and a value of 10 indicating the maximum level of happiness.

The Table (1) contains the main indicators from the computer results and the statistical indicators from the data used for all the selected countries in this study:

Table (1): Statistical indicators of data used for selected countries

UNEM[1]	INF[2]	FERR[3]	DIVR[4]	MARR[5]	GDPP[6]	HAPPYNESS[7]	
7.5834	3.0585	1.7069	2.1503	5.3746	36538.68	6.4522	Mean
7.1600	1.8811	1.6900	2.0650	5.1000	41508.92	6.7134	Median
19.480	36.603	2.391	4.000	12.900	118823.6	7.9709	Maximum
2.800	1.545-	1.230	0.7530	3.000	4904.33	4.609	Minimum
2.8567	4.6690	0.26	0.6462	1.7839	24854.80	0.9125	Std. Dev.
210	210	210	210	210	210	210	Observations

Source: Obtained using EViews Software.

According to the data used and the results obtained, the average happiness in the set of selected countries is 6.4522 within range of zero to ten. The smallest value concerning 210 observations corresponds was 4.609 in Iran in 2012 and the highest was 7.9709 in Denmark in 2008. The median

[1] Unemployment (percentage of total labor force participation)
[2] Inflation (consumer price)
[3] Total fertility rate (births per woman)
[4] Divorce rate (per 1,000 people)
[5] Marriage rate (per 1000 people)
[6] GDP per capita (US dollar)
[7] Happiness (on a scale of 1 to 10)

happiness data of these observations is 6.7134; indicating that half of the observed happiness are below this value and the other half are above this value. The standard deviation indicates the dispersion of the happiness observations that is 0.9125 which is considerable high.
In order to compare the situation in Iran, we have summarized the statistics in Table (2):

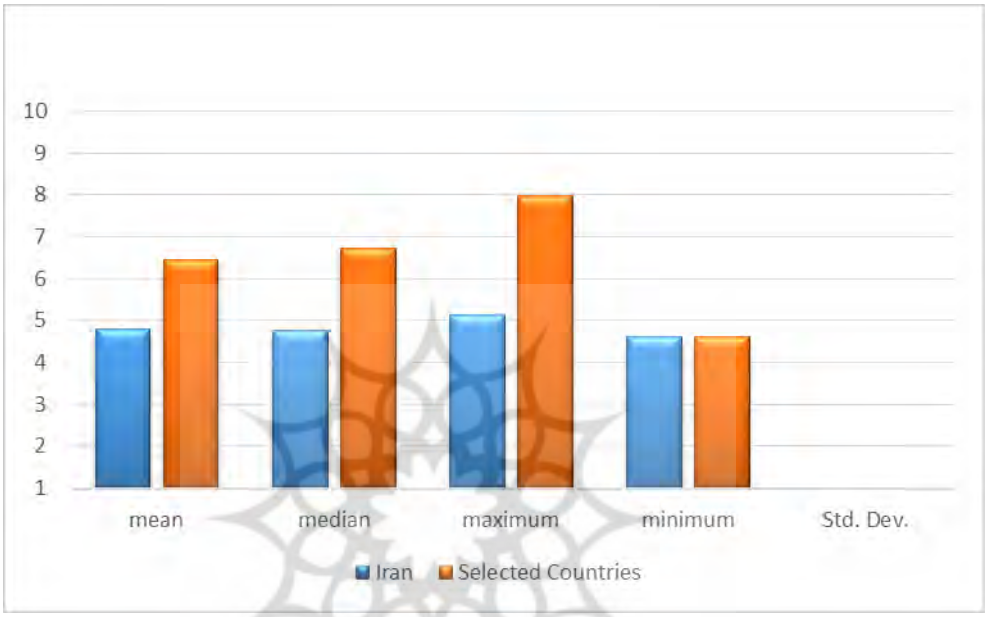
Table (2): Statistical indicators of the data used for Iran

UNEM	INF	FERR	DIVR	MARR	GDPP	HAPPYNESS	
11.8	18.3586	1.9416	1.864	10.808	6101.81	4.8058	Mean
12.1	15.0790	1.923	1.925	11.215	5713.63	4.7587	Median
13.52	36.6030	2.116	2.24	12.9	7927.85	5.1396	Maximum
10.44	7.2454	1.811	1.38	8.61	4904.33	4.6089	Minimum
1.0882	9.9088	0.1118	0.2664	1.5823	1025.78	0.1843	Std. Dev.
10	10	10	10	10	10	10	Observations

Source: Obtained using EViews Software.

Comparing the statistical indices of Iran with that of the selected countries we can indicate that:
The average GDP per capita in the selected countries is 36538.68 USD, while in Iran it was about 6101.81. In other words, the average GDP per capita in the selected countries is 5.99 times higher than the GDP per capita in Iran, which indicates a big difference. The minimum GDP per capita of the selected countries were 4904.33 in Iran in 2015. The maximum value was 118823.65 USD for Luxembourg in 2014.
The average marriage rate (per 1,000 persons) is 5.3746 in the selected countries (including Iran) and 10.808 in Iran. In other words, the marriage rate in Iran is almost double that of the marriages in selected countries. The average divorce rate (per 1,000 persons) in the selected countries and Iran is 2.1503 and 1.864, respectively. It is important to note despite the average marriage rate in Iran being twice higher than the selected countries, the divorce rate in Iran is about 0.86 times of the selected countries including Iran.
The average total fertility rate (births per woman) in the selected countries and Iran are 1.7069 and 1.9416 respectively, which demonstrates that the average fertility rate in Iran is 1.14 times higher than in the selected countries.

Inflation (based on consumer prices) in the selected countries and Iran is 3.585 and 18.3586 on average respectively. Inflation in Iran is 6 times higher on average in these years compared to the selected countries.
Unemployment (percentage of total labor force) is 7.5834 and 11.8 on average in the selected countries and Iran respectively, which means that unemployment in Iran is 1.56 times higher than in the selected countries.
We compare the happiness in Iran and selected countries concerning Fig 1:

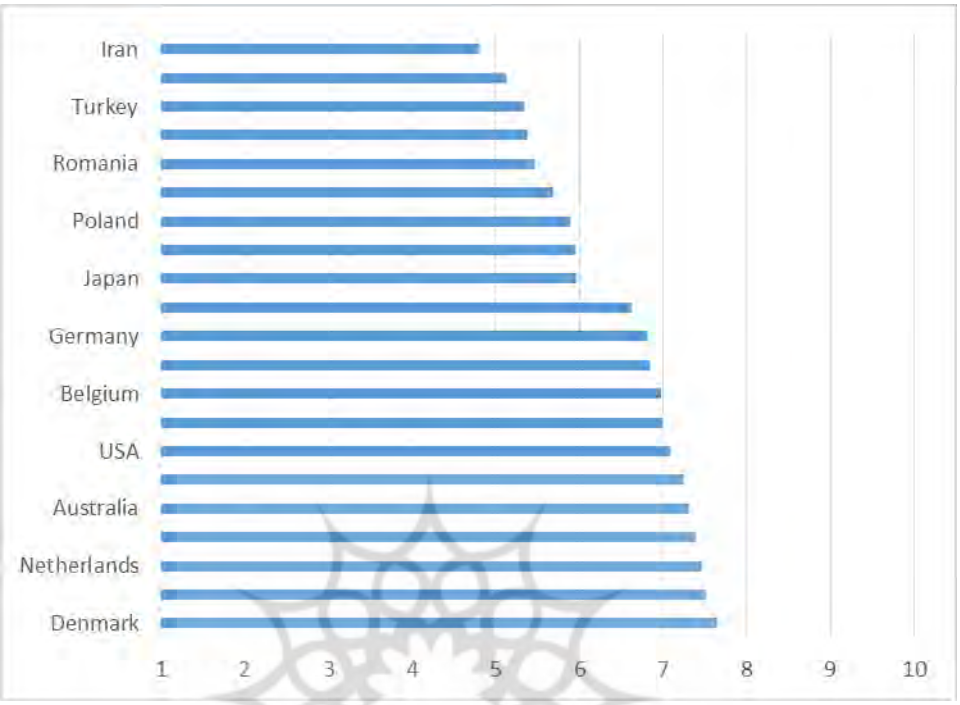


Source: Research Findings

Fig 1. Comparison table of happiness index of selected countries and Iran

It should be noted that Iran is one of the selected countries and 10 out of 210 observations of happiness refer to Iran. A simple comparison shows that there is a significant difference between the statistical indicators of happiness in Iran and the selected countries, which indicates the unfavorable conditions in Iran in terms of happiness.
As you can see in the table above, the average happiness in Iran from 2008 to 2017 is 4.8058 and for the selected countries it is 6.4522, which is calculated on a scale of 1 to 10. The median of the happiness data for Iran is 4.7587, which means that half of the happiness observations are below 4.7587 and the other half are above this value. The standard deviation of

this data is 0.1843. The maximum value of happiness in these ten years is 5.96, which is still a low value compared to the selected countries.



Source: Obtained using EViews Software.

Fig (2). Bar chart of the average of happiness of selected countries

Bar chart of Fig (2) demonstrates the average happiness level in selected countries from highest to lowest. On average, Denmark has the highest happiness level of 7.6495, followed by Finland with 7.5071. Iran has the lowest level of 4.8058.

3.2. Correlation coefficient and its effect on model estimation results

Correlation coefficient is a statistical tool that determines the nature and degree of relationship between a quantitative variable and other quantitative variables. The correlation coefficient indicates the type of relationship between the two variables (direct or inverse) and the intensity of this relationship and its value ranges from 1 to 1. We calculated the correlation coefficient of the variables of this model in Ives 10 software. The results are shown in Table (3).

Table (3): Correlation coefficient of model variables

Variables	HAPPY	MARR	DIVR	FERR	GDPP	INF	UNEM
HAPPY	1.0000						
MARR	0.4306-	1.0000					
DIVR	0.1794	0.1176	1.0000				
FERR	0.1971	0.3131	0.1528-	1.0000			
GDPP	0.7178	0.4397-	0.2823	0.0929-	1.0000		
INF	0.4460	0.6660	0.1613-	0.2682	0.3544-	1.0000	
UNEM	0.5448-	0.3275-	0.2891	0.0040	0.4307-	0.2731	1.0000

Source: Estimated using EViews Software.

As can be seen in Table (3), the estimation results can be trusted because the correlation coefficients between the variables are not very high.[1]

3.2. Model Specification

In this study, we examined 21 countries in the world from 2008 to 2017 using the data panel method. The model used to show the relationship between demographic variables and happiness is as follows:

$$Happy_{it} = \beta_0 + \beta_1 GDPPC_{it} + \beta_2 FERR_{it} + \beta_3 MARR_{it} + \beta_4 DIVR_{it} + \beta_5 UNEM_{it} + \beta_6 INF_{it} + \varepsilon_{it}$$

In the panel data model that uses cross-sectional data and time series in combination, we examine the relationship between variables. We define the variables of this model according to country i and time t. In this model Happiness (Happy) is the dependent variable. The independent variables are the Fertility rate (FERR), Marriage rate (MARR), Divorce rate (DIVR), and the GDP per capita (GDPP), Inflation (INF) and Unemployment (UNEM) are used as the control variables.

4. Model estimation and hypothesis testing

The first step of the estimation is analyzing variable stationarity. Srrrrrrrr rry ss ttt tttt a llll , ttt ttss an ammmiinnn eeed ooeaaeeeeeaa... When a time-series process is stationary, it reverts to a constant mean and variance, without altering over time or following a trend. The necessity of stationarity of data lies in the risk of receiving regression results that are significant, although these are unrelated to the nonstationary series (Hill et al., 2008). To avoid a false regression, stationarity of the variables must be evaluated. In this study, the Phillips-Perron Fisher unit root test was used

[1] As you see on Table 9, R^2 of the model is 0.9703 and the highest correlation coefficient between variables is 0.6660 which is smaller than the R^2 that is 0.9703. So, we can ignore the multicollinearity problem in the model.

to evaluate the significance of the variables. The results of this test can be seen in Table (4).

Table (4): Phillips-Perron Fisher Unit root test

Variable	Statistic	Prob
HAPPY	90.4946	0.0000
MARR	127.773	0.0000
DIVR	73.0595	0.0021
FERR	66.3389	0.0097
GDPPC	105.347	0.0000
INF	98.7442	0.0000
UNEM	141.051	0.0000

Source: Estimated using EViews Software.

According to the results, all of the probabilities of type I error are under 0.05, therefore all variables are stationary at the level.

The next step is to detect whether the model is pooled or paneled. One of the most common tests to recognize that is the F-Limer (Chow) test. First, we must determine that in the sample under study, the regression relationship has a width of heterogeneous sources and a homogeneous slope, or in other words, the hypothesis of width of common sources and common slope between sections is accepted. The results of this test are given in Table (5):

Table (5): F-Limer test results

Redundant Fixed Effect Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	48.248106	(20,183)	0.0000

Source: Obtained using EViews Software.

As can be seen, the width of the origin of all countries cannot be considered the same, and the probability of error is below 0.05. In other words, the zero-hypothesis based on pooled model estimation is rejected, therefore, the data is a panel. In the next step a fixed or random effects method is chosen.

The Hausman test for panel data is the basis to identify whether the model is fixed effects or random effects. Rejection of the zero hypothesis states that we should use fixed effects, and failure to reject it implies the use of random effects.

The results of this test are given in Table (6).

Table (6): Hausman test results

Correlated Random Effect-Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.150777	6	0.0002

Source: Obtained using EViews Software.

Based on the results of Table (8), the chi-square statistic calculated for the parameters is 26,150. Due to the low prob, we cannot accept the zero hypothesis, therefore, we conclude that the appropriate method for estimating the model is the fixed effects method.
It is concluded that the model is estimated as a panel of fixed effects. The results of the estimation are given in Appendix (3) and a summary of it is given in Table (7).

Table (7): Results of fixed effects estimation

Variable	Coefficient	t-Statistic	Prob
C	5.5573	17.2140	0.0000
Marriage Rate	0.0319	1.1846	0.2377
Divorce Rate	-0.0889	-1.7925	0.0747
Fertility Rate	0.6006	3.6913	0.0003
GDP Per Capita	6.39E-06	2.4900	0.0137
Inflation	-0.0028	-0.5272	0.5987
Unemployment	-0.0443	-4.9360	0.0000
R-squared	0.9703	F-statistics	229.8096
Adjusted R-squared	0.9660	Prob(F-statistics)	0.000000

Source: Estimated using EViews Software.

The effect of GDP per capita on happiness is significant at 1% and positive. An increase in GDP per capita, which indicates an increase in economic growth and national income per capita of a country, increases the happiness of the country. If GDP per capita increases by one unit, happiness increases by 6.39×10^{-6} units which is very small.
The effect of the fertility rate variable on happiness at 1% level is significant and positive. It can be concluded that childbearing leads society to be happier. If the fertility rate increases by one unit, happiness increases by 0.6006 units.
The effect of the unemployment variable on happiness at 1% level is significant and negative. Unemployment is associated with lower incomes, so we could conclude that rising unemployment lowers the happiness of

the people of the society. If the unemployment rate increases by one unit, happiness drops by 0.0443 units.

The effect of the divorce rate variable on happiness at 10% level is significant and negative. Divorce has always been unpleasant, and results show the more divorce there is in a society, the less happiness there is in that society. If the divorce rate increases by one unit, happiness decreases by 0.0889 units.

Lastly, marriage rate and inflation rate are not significant, but their effects on happiness are positive and negative respectively. More inflation is a sign of lower purchasing power of the people of the society, so it has a negative effect on happiness, and marriage is often accompanied by happiness therefore, increasing the marriage rate is in a same way with people's happiness.

According to the results of estimating this model, all the hypotheses of this research are correct.

The high value of R^2 indicates its high explanatory power. In other words, it can be said that 0.9703 of the variances in happiness are explained by the explanatory variables.

The results of this study can be considered as confirmation of the results of last studies that evaluated the effect of these variables on happiness.

5. Conclusion and Suggestion

The main purpose of this study was to estimate and compare the effect of changes in demographic variables on happiness using panel data from 21 selected countries, including Iran during the most recent data available concerning the period 2008 to 2017.

At first, the F-Limer test was performed. Zero hypothesis (the same constant parameter of different sections) was rejected. The Hausman test was then used to determine the fixed or random effects. The results of this test showed that the difference in constant terms between different sections are not random; therefore, the fixed effect approach is used to estimate the model. The results indicate that:

The effect of the fertility rate variable on happiness at 1% level is significant and positive. If the fertility rate increases by one unit, happiness increases by about 0.6006 units.

The effect of divorce rate variable on happiness at the 10% level (which is relatively low) is significant and negative. If the divorce rate increases by one unit, happiness decreases by 0.0889 units.

The effect of GDP per capita on happiness at 1% level is significant and positive. If GDP per capita increases by one unit, happiness increases a little of about 6.39×10^{-6} units. The effect of the unemployment variable on happiness at 1% level is significant and negative. If the unemployment rate increases by one unit, happiness decreases about 0.0443 units. Although the effects of each of the variables of marriage rate and inflation rate on happiness were positive and negative respectively, these effects were not significant. According to the results, increasing fertility and income per capita, reducing unemployment and divorce rates can increase happiness in society.

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Appendix

Appendix 1: Descriptive statistic of selected countries

Date:07/30/21
Time: 22:53
Sample: 2008 2017

	HAPPINESS	MARRIAGE_RATE	DIVORCE_RATE	FERTILITY_RATE	GDP_PER_CAPITA	INFLATION	UNEMPLOYMENT
Mean	6.452233	5.374628	2.150346	1.706955	36538.68	3.058512	7.583429
Median	6.713447	5.100000	2.065000	1.690000	41508.92	1.881092	7.160000
Maximum	7.970892	12.90000	4.000000	2.391000	118823.6	36.60304	19.48000
Minimum	4.608928	3.000000	0.753066	1.230000	4904.327	-1.544797	2.800000
Std. Dev.	0.912521	1.783893	0.646247	0.259937	24854.80	4.669000	2.856706
Skewness	-0.403540	1.628830	0.316202	0.423082	0.942181	3.919613	1.149017
Kurtosis	1.875192	6.665265	3.032762	2.446802	4.182372	22.79757	4.980978
Jarque-Bera	16.76999	210.4070	3.508812	8.942688	43.30222	3967.227	80.54584
Probability	0.000228	0.000000	0.173010	0.011432	0.000000	0.000000	0.000000
Sum	1354.969	1128.672	451.5727	358.4605	7673124.	642.2876	1592.520
Sum Sq. Dev.	174.0331	665.0956	87.28565	14.12160	1.29E+11	4556.108	1705.601
Observations	210	210	210	210	210	210	210

Appendix 2: Descriptive statistic for Iran

Date: 08/23/21
Time: 21:17
Sample: 1 10

	HAPPINESS	MARRIAGE_RATE	DIVORCE_RATE	FERTILITY_RATE	GDP_PER_CAPITA	INFLATION	UNEMPLOYMENT
Mean	4.805837	10.80800	1.864000	1.941600	6101.809	18.35862	11.80000
Median	4.758731	11.21500	1.925000	1.923000	5713.631	15.07905	12.10000
Maximum	5.139579	12.90000	2.240000	2.116000	7927.847	36.60304	13.52000
Minimum	4.608928	8.610000	1.380000	1.811000	4904.327	7.245425	10.44000
Std. Dev.	0.184339	1.582297	0.266383	0.111771	1025.783	9.908823	1.088251
Skewness	1.063317	-0.198215	-0.552096	0.309417	0.886609	0.514452	-0.040722
Kurtosis	2.744815	1.591051	2.331506	1.643878	2.446767	2.003929	1.673152
Jarque-Bera	1.911538	0.892622	0.694219	0.925843	1.437654	0.854500	0.736316
Probability	0.384516	0.639985	0.706728	0.629442	0.487324	0.652300	0.692008
Sum	48.05837	108.0800	18.64000	19.41600	61018.09	183.5862	118.0000
Sum Sq. Dev.	0.305828	22.53296	0.638640	0.112434	9470085.	883.6630	10.65860
Observations	10	10	10	10	10	10	10

Appendix 3: Results of Model Estimation

Dependent Variable: HAPPINESS
Method: Panel EGLS (Cross-section weights)
Date: 08/02/21 Time: 23:34
Sample: 2008 2017
Periods included: 10
Cross-sections included: 21
Total panel (balanced) observations: 210
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MARRIAGE_RATE	0.031920	0.026945	1.184642	0.2377
DIVORCE_RATE	-0.088935	0.049614	-1.792521	0.0747
FERTILITY_RATE	0.600623	0.162711	3.691338	0.0003
GDP_PER_CAPITA	6.39E-06	2.57E-06	2.490054	0.0137
INFLATION	-0.002782	0.005277	-0.527229	0.5987
UNEMPLOYMENT	-0.044265	0.008968	-4.936009	0.0000
C	5.557291	0.322835	17.21400	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.970283	Mean dependent var	8.588903
Adjusted R-squared	0.966061	S.D. dependent var	4.343087
S.E. of regression	0.198087	Sum squared resid	7.180618
F-statistic	229.8096	Durbin-Watson stat	1.631204
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.956355	Mean dependent var	6.452233
Sum squared resid	7.595708	Durbin-Watson stat	1.432567

اثر تغییرات متغیرهای جمعیتی بر شادمانی[1]

چکیده

دستیابی به آرامش و شادمانی هدف اساسی در زندگی اقتصادی است. هدف اصلی در این پژوهش، برآورد و مقایسه اثر تغییرات متغیرهای جمعیتی بر شادمانی با استفاده از داده‌های سری زمانی ۲۱ کشور منتخب از جمله ای ایران طی دوره زمانی ۲۰۰۸ الی ۲۰۱۷ است. برآورد به روش پانل و اثرات ثابت انجام شد. نتایج حاکی از آن است که اثر نرخ باروری و تولید ناخالص داخلی سرانه[2] بر شادمانی معناردار و مثبت، نرخ طلاق و بیکاری معنادار و منفی است. همچنین اثر تورم مثبت و اثر نرخ ازدواج منفی ولی معنادار نمی‌باشد.

کلمات کلیدی: شادمانی، تغییرات متغیرهای جمعیتی ، داده‌های پانل.

[1] The Effect of Changes in Demographic Variables on Happiness
[2] GDP Per Capita