

“Effect of Economic Liberalization Elements on Health Indices” (Case Study: Selected Petroleum Exporting Countries)

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Abstract: Dynamism of members of a community and quality of their presence at various economic and social arenas has a special position in today world. Paying attention to people’s health and how economic factors impact on health indices is assumed as one of the most essential topics in decisions made by directors in a country. Similarly, paying attention to direct and indirect impacts of health in various fields and addressing its portion in Gross Domestic Product (GDP) and considering it as a parameter to measure development in any country and noticing the effective elements for it will be assumed as an inevitable issue. Economic liberalization (freedom) and investment in this field may improve health indices. The present study has analyzed the effect of economic liberalization elements including commercial liberalization, monetary freedom and financial liberalization on health indices in ten selected countries using panel data techniques during 1995-2014. The results derived from final approximation of models signify the positive effect of economic liberalization elements on the studied health indices in the selected nations.

Key words: Economic liberalization, health indices, petroleum exporting countries, panel data, Iran

INTRODUCTION

Surely, health of manpower is considered one of the most basic efficient factors on growth and development and improvement of various levels of system of a country. Likewise, it is assumed as an important and valuable tool and goal for a country. Today, it has been proved that individuals who enjoy higher physical and mental health and fitness can cooperate in production process and presentation of services more efficiently and usefully. Growth and excellence of a country has a direct and close relationship with the health of members of that community and it may lead to improvement of welfare, social and economic status of countries. Several factors play a role in the improvement of health level among members of community and or its reduction and decline. Identifying their nature and the given effective factors will play the foremost role and knowing it is a precious asset that will both add to health of members and community and contribute to optimal allocation of limited individual and general sources individuals and governments. If health factors and their importance are threatened and improved, the conducted measures for upgrading individual and social health will not be free from ambiguity and hesitancy. Probably, the limited sources in some countries, particularly the poor and needy nations, are

allocated for years in such a way that they only result in reduced health and life expectancy, rising mortality and loss of financial and human resources. Accordingly, of effective factors in this field, one can refer to economic freedoms. Most studies show the effect of economic liberalization on the efficiency of financial systems and the related problems for information asymmetry. The main message of economic freedom index is that the countries may grow and develop economically. The experience indicates in various countries it has been shown that the economic status in countries with open-door economy is much higher than in those with closed economies. The economic freedom is the harbinger of more healthy, sound, richer and productive for the people throughout the world (Fetros *et al.*, 2012).

Inter alia, the health system in a country may also be considered as one of the important and effective factors from economic freedom indices. Thus, this point may be explored in major part of the given study whether economic liberalization elements may affect health indices or not.

In this regard, Stroup(2006) has explored the effect of economic freedom and democracy on health (life expectancy), education and preventing diseases in the society. The results imply that economic freedom in these variables is increased even in nations with greater

democracy. Mixton and Roseman (2003) have analyzed the impact of economic liberalization on life expectancy for females and males. This article considers fertility potential, AIDS disease income, urbanism percentage, economic freedom and government's attitude as influential factors on life expectancy. The author expresses that the empirical evidences prove that economic freedom increases life expectancy. In an investigation titled 'for seven countries during years (2000-2010)', Fetros, Akbari Shahrestani and Mirzayee (2012) reviewed the effect of economic freedom on economic growth and life expectancy. Their finding suggested the positive and significant impact of economic freedom on economic growth and the positive and significant effect of economic growth and economic growth total index on life expectancy. Therefore, economic freedom may increase life expectancy in the selected countries. In a survey titled 'Effect of economic freedom on health indices', Jafari and Karimi (2012) analyzed the relationship among parameter of freedom with health indices in Iran and compared them with those in some other countries. The results indicated the countries which are classified at higher ranks in terms of economic freedom, there is a better condition in terms of public health indices as well. Based on the importance of this issue in this study, it has been dealt with the determination of impact of economic liberalization elements on health indices in a selected group of developing petroleum exporting countries in the world including Iran indonesia, Thailand, Tunisia, Peru, Colombia, Mexico, Malaysia india and Venezuela during years 1995-2014. After dealing with basic issues, it has been referred to empirical studies regarding this subject in this investigation and then methodology and research findings have been reviewed and finally operational strategies have been proposed after the conclusion.

Theoretical bases: Theoretical bases have been classified into parts in this study: in the first part, we have expressed theoretical concepts regarding health and selected parameters and their impact on economy and in the second part, we have referred to the issue of economic liberalization and its effect on health.

Health and its importance and effect in economy of countries: The issue of health is a multidimensional issue that various factors and elements affect its development and destruction and all members, systems and organizations in a society play roles in its creation as well as receiving health consequences (Minnesota, 2002). As one of the main fields of healthy economy, social determinants of health are a subject proposed in this regard. Although healthcare may improve health in

individuals, determination of economic and social conditions as an origin for the creation of disease may essentially have an impact on improvement of health in individuals (Wilkinson and Marmot, 2003). Improvement in the status of public health is regarded as an ultimate goal of development since healthy and motivated individuals realize development goals. Therefore, it is followed by investment in goods and services that are led to more health and in turn exacerbates higher economic growth automatically. Allocation of more sources to healthcare and treatment sector does not only lead to higher health and efficiency, but also reduces poverty and makes distribution of revenues equitable. Health affects economic growth by improving productivity level, rising supply for workforce increasing saving and formation of investment (Emadzadeh *et al.*, 2013). Whereas life expectancy is one of the determinant factors for human development index and health, thus World Health Organization (WHO) implied some objectives under the title of Third Millennium Goals for upgrading health level in developing countries in September 2000 out of which one can refer to the following cases:

- Eradication of absolute poverty and hunger
- Reduction of infant mortality rate (under 5 years)
- Improvement of mothers' health
- Fighting against AIDS, malaria and other contagious diseases where these cases impact directly on people's health

Health increases lifetime and influences through life cycle, saving and investment. Through, reducing mortality rate and improvement of life expectancy, health increases the number of active workforces and transforms the structure of population. Therefore, today health is assumed as one of the factors of economic growth and preparatory factors for sustainable development (Emadzadeh and Kandahari, 2013). Similarly, health improves learning potential and capacity in individuals increases production power and earning income and reduces their disability and fatigue and restricts days of absences for illness in manpower. The evidences signify that in countries in which the people enjoy more health the sources, stipulated to be allocated to healthcare and medical issues, may be allotted to other activities including removal of deprivation and elimination of poverty (Schultz, 2005). The public health in a society is considered s a 'public good' at macro level. In addition, a group of measures that improve public health in the world is regarded as 'world public good' (Jamison *et al.*, 1998). At present, it has been clarified that production of world public goods does not only lead to further economic

growth in developing countries, but also improves distribution of incomes in these communities (Kaul and Faust, 2001).

Barro (1996) declares that given other factors as fixed parameters, upgrading of life expectancy from 50-70 years may increase economic growth about 104%. Studies conducted by Naeem(2009), Bloom(2004), Rivera and Currais(2004), Malik (2006), Clarke and Islam(2003) and Howitt(2005) have shown in this point, using data from time series for various countries and different parameters of health, that health index has impacted positively on economic growth. Similarly, studies from Amini and Hejazi Azad (2007) along with using Autoregressive Distributed Lag (ARDL) reviewed the impact of health index (life expectancy) on productivity of manpower. Salmani and Mohammadi (2009), Beheshti (2007) and Hadian *et al.* (2006) using data from time series and Mehrara and Fazayeli (2009) and Mojtahedi and Javadipour (2004) have analyzed the effect of health expenses on economic growth by means of integrated data where their findings indicated that health indicators had positive impacts on economic growth. explored the role of health on productivity of family. In addition, Marandi (2007) studied the mutual effects of health, productivity and economic growth in an investigation where the findings signified positive effect of health on productivity and economic growth. Some studies which have dealt with the analysis of causation between health expenses and economic growth and their results, signify the causation relationship among these two variables in short-term and run, out of them one can refer to studies conducted by Erdile and Yekiner (2004) and Devlin and Hansen (2001). Overall, it is implied that there is a mutual relationship between health and economic growth. Health improvement in members of community, especially workforce, directly impacts on economic growth and this may be followed by economic and social development of the community. On the other hand, economic growth may lead to upgrading national health level (Lotfalipour *et al.*, 2011).

Economic liberalization and its effect on health:

Economic freedom is one of the important principles in assessing the economic development of countries. Liberalization process usually causes increase in efficiency of financial system through deletion of inefficient institutes and exertion of pressure for correction of financial superstructures and reduction of the problems regarding information asymmetry such as reverse selection and morality phobia (Claessens *et al.*, 2001). According to planners' attitude, Economic Freedom Index (EFI) in Heritage Institute, where freedom means

lack of requisite, pressure and/or restriction in selection of action and economy is related to production, distribution and consumption of goods and services, one can interpret economic freedom as absence of imposition and constraint for production, distribution and consumption of goods and services (Johnson, 2000). Based on the opinion of Holmes (2008), economic freedom is considered vital for human conditions (Sen, 2002).

Paying attention to some cases such as economic liberalization and its infrastructures in various fields and including health sector is extremely important. Optimal and appropriate use of financial sources and facilities and human capitals prepares the ground for growth, progress and prosperity of countries. Economic factors are some of economic freedoms that may have essential impacts on people's health and thus their life expectancy, reduction in mortality rate, improvement of public health, decrease in health costs etc. The mortality may also be due to unfavorable economic conditions and lack of economic freedom (Jafarzadeh and Beheshti, 2011). Instability in macroeconomic policies in a country changes the payment balances of that country. In other words, balance of payment may have a coordinate relationship with health indices because of its direct relationship with commercial periods and prosperous economy and recession. The mental health of individuals also changes in coordination with economic periods (Ruham, 2003). Countries that possess better conditions in terms of economic freedom will generally have relatively exercised improvement in health parameters. Similarly in countries that enjoy governmental economy, health parameters are tangibly at lower levels than the nations which are placed at higher position in ranking of UN in terms of economic freedom (Jafari and Karimi, 2012). According to statement of Bloomberg Website (2012), rising economic freedom at any country causes an increase about 20 years in rate of life expectancy. The economic theories agree unanimously on this issue as usual that more economic freedom, especially in the long run, leads to rising life expectancy (ESposto and Zalesky, 1999).

Various studies during recent decades; on the one hand, signify the necessity for more due attention to economic issues in order to enjoy spiritual-mental health to achieve more welfare; and on the other hand, refer to mutual effect of health on economy. The healthy community may pass more quickly through advancement steps and with lower costs. For instance, due to paying more attention to subject of health and status of health for members of community, modern advanced countries enjoy much higher growth and welfare and this has caused an increase in their lifetime, reduced mortality rate and a decrease in types of contagious and non-contagious

diseases and they include happier and healthier society. Production of various types of antibiotics and advancements in medical and medicinal sciences has extremely reduced the number of diseases and has reduced mortality rate and risen life expectancy. However, it should not be forgotten that economic growth has led, during these years to better feeding people, their receiving more training and more benefits more from public services (e.g., healthy water and various types fighting against diseases including malaria that prevents from transference of diseases) (Solow, 1956). Therefore, economic freedom causes rising quality of life increase in life expectancy, reduced mortality rate and improvement in health indices as a whole.

MATERIALS AND METHODS

Statistical data and information: Panel data-based regression has been utilized in this study to estimate the research model. In order to select the studied countries, efforts have been made to choose a group of cohort (similar) countries. Therefore, three criteria have been considered to select the given countries including:

- Development
- Being petroleum exporters
- Being richer in terms of the needed statistics and data

The spatial territory of this study is 10 selected developing countries as the petroleum exporters in the world. These countries include Iran indonesia, Thailand, Turkey, Tunisia, Peru, Colombia, Mexico India and Venezuela. All data from the variable used in this study are related to time period 1995-2014 extracted from World Bank and the leading world scientific institutes such as Heritage Institute and Fraser where the subject field of this study is also macroeconomics for health sector. The theoretical topics and empirical studies in this investigation have been collected by librarian method and attribution (documentary) technique was employed for analysis of subject literature.

Introduction of research models: The given model is excerpted from model of Mixon *et al.* (2003) in order to analyze the effect of economic liberalization elements on health indices based on the existing theoretical principles and conducted empirical studies so that this model is defined in relation to these health elements and indices as follows:

$$HE_{it} = \theta_0 + \theta_1 FR_{it} + \theta_2 HIV_{it} + \theta_3 LNIN_{it} + \theta_4 PU_{it} + \theta_5 HEX_{it} + \theta_6 Flit + U_{it} \quad (1)$$

Where:

- HE = Health index
- Fr = Fertility rate
- HIV = HIV morbidity
- LNIN = Logarithm of Income
- PU = Percentage of Urbanism
- HEX = Health Expenses
- FI = economic freedom/Freedom Index. The disorder component I = 1, 2,...,n
- Uit = Countries
- t = 1, 2,...
- T = Time

With respect to definition and classification proposed by Heritage Institute, they are deemed as economic freedom parameters based on ten valid criteria. In this model, only three elements and indices of economic freedom have been considered as independent variables at model including Trade Liberalization (TL), Financial Liberalization (FL) and Monetary Liberalization (ML).

Thus, rather than determining the effect of each of three elements of economic liberalization as independent variables in this study, also three parameters of Life Expectancy (LE) Infant Mortality Rate at age <5 years (IMR), Health of Drinking Water (HDW) were designated for each of health indices as independent variables. Therefore, 9 separate models result for estimation. In order to determine the rate of effect by either of economic liberalization indices on health parameters, the independent regression is tested for three economic liberalization elements. Now, the effect of each of the presented models was mentioned, tested and evaluated on each of health parameters. Each of health indices in these models is as follows:

- First model: Life Expectancy index (LE)

$$LE_{it} = \alpha_0 + \alpha_1 FR_{it} + \alpha_2 HIV_{it} + \alpha_3 LNIN_{it} + \alpha_4 PU_{it} + \alpha_5 HEX_{it} + \alpha_6 Flit + U_{it} \quad (2)$$

- Second model: Infant Mortality Rate Index at age <5 years (IMR)

$$IMR_{it} = \beta_0 + \beta_1 FR_{it} + \beta_2 HIV_{it} + \beta_3 LNIN_{it} + \beta_4 PU_{it} + \beta_5 HEX_{it} + \beta_6 Flit + U_{it} \quad (3)$$

- Third model: Healthy Drinking Water (HDW) index

$$HDW_{it} = \gamma_0 + \gamma_1 FR_{it} + \gamma_2 HIV_{it} + \gamma_3 LNIN_{it} + \gamma_4 PU_{it} + \gamma_5 HEX_{it} + \gamma_6 Flit + U_{it} \quad (4)$$

RESULTS AND DISCUSSION

As described in the methodology section in order to examine the effect of economic liberalization elements on some of the selected health indices from petroleum exporting countries, the research models were estimated and an analysis was carried out on the impact of economic liberalization elements on life expectancy infant mortality rate (under age 5) and health of drinking water. The results and estimation of models have been referred to in the followings. It necessitates initially correlation of residues to be placed within tested sections in process of approximation by means of panel data technique and Pesaran cross-sectional independence test is utilized for this purpose. Null hypothesis (H_0) is assumed in Pesaran test based on lack of correlation among sections and Hypothesis (H_1) denotes the presence of correlation between sections. The results of this test are shown in Table 1-3.

Before estimation of models, it is necessary to make sure of the reliability of variables. To this end, Fisher and Hadri Unit Root test was utilized to test reliability of variables and the relevant results are reported in Table 4.

With respect to the acquired results, it was observed that Null Hypothesis (H_0) in Fisher's test was rejected according to non-stationary of data in all variables of the model that was based on their stationary nature. In Hadri test, Null Hypothesis (H_0) denotes stationary data and hypothesis (H_1) is based on non-stationary nature. Therefore, hypothesis (H_1) is disproved about all variables of the model that was based on stationary mode for them. In order to specify the process of model estimation, type of data should be identified including panel or combinatory data. To this end, Limer F-test is used (Table 5).

Here, results of Limer test also signify rejection of null hypothesis and approval of the presence of homogeneity among cross-sections, so panel data technique is accepted for statistical data. Hausmann test is employed in order to determine fixed effects or stochastic effects in estimation of the model. The result of these tests is reported in Table 6.

With respect to the result in Table 7, hypothesis H_1 that verified fixed effects in 8 models may not be disproved and it is rejected only in two models. Therefore, 8 models are estimated within the framework of fixed effects and one models are analyzed by stochastic effects. By employing technique of stochastic effects, Breusch-Pagan test (Lagrange Multiplier LM) that includes statistic χ^2 - with degree of freedom 1 examines precision among Ordinary Least Square (OLS) in

Table 1: Result of pesaran cross-sectional independence test (life expectancy)

Model	Test statistic	Probability error	Results
TL	1.488	0.1367	Lack of cross-sectional correlation
ML	1.018	0.3086	Lack of cross-sectional correlation
FL	1.502	0.1331	Lack of cross-sectional correlation

Table 2: Result of cross-sectional independence test for boys (infant mortality rate at age below 5 years)

Model	Test statistic	Probability error	Results
TL	7.170	0.0000	Presence of cross-sectional correlation
ML	6.483	0.0000	Presence of cross-sectional correlation
FL	8.010	0.0000	Presence of cross-sectional correlation

Table 3: Result of cross-sectional independence test for boys (healthy drinking water)

Model	Test statistic	Probability error	Results
TL	1.841	0.0656	Lack of cross-sectional correlation
ML	1.950	0.0512	Lack of cross-sectional correlation
FL	0.493	0.6222	Lack of cross-sectional correlation

Table 4: The results derived from stationary test (Fisher-Hadri)

Variables	Test statistic	Probability error	Results
The results of reliability Hadri test			
LE	36.4073	0.0000	Stable
IMR	36.1281	0.0000	Stable
HDW	35.4198	0.0000	Stable
TL	22.5186	0.0000	Stable
ML	13.937	0.0000	Stable
FL	22.3553	0.0000	Stable
FR	32.1078	0.0000	Stable
HIV	34.3987	0.0000	Stable
LNIN	36.0547	0.0000	Stable
PU	36.5502	0.0000	Stable
HEXLE	22.7854	0.0000	Stable
The results of reliability of Fisher test			
LE	157.792	0.0000	Stable
IMR	613.495	0.0000	Stable
HDW	78.4904	0.0000	Stable
TL	91.5817	0.0000	Stable through trend
ML	88.2186	0.0000	Stable
FL	116.356	0.0000	Stable
FR	344.126	0.0000	Stable through trend
HIV	58.2025	0.0000	Stable
LNIN	136.871	0.0000	Stable
PU	173.837	0.0000	Stable
HEXLE	149.369	0.0000	Stable

Table 5: Result of F-Limer test

Model	Test statistic	Probability error	Results
Life Expectancy (LE)			
TL	110.52	0.0000	Panel data
ML	110.31	0.0000	Panel data
FL	119.13	0.0000	Panel data
Infant Mortality Rate at age <5 years (IMR)			
TL	56.56	0.0000	Panel data
ML	79.77	0.0000	Panel data
FL	75.22	0.0000	Panel data
Health of Drinking Water (HDW)			
TL	322.5	0.0000	Panel data
ML	294.63	0.0000	Panel data
FL	233.86	0.0000	Panel data

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Table 6: Result of Hausmann test

Model	Test statistic	Probability error	Results
Life Expectancy (LE)			
TL	89.37	0.0000	Fixed effects
ML	146.1	0.0000	Fixed effects
FL	101.91	0.0000	Fixed effects
Infant Mortality Rate at age <5 year (IMR)			
TL	89.61	0.0000	Fixed effects
ML	713.7	0.0000	Fixed effects
FL	356.04	0.0000	Fixed effects
Health of Drinking Water (HDW)			
TL	7.43	0.2831	Fixed effects
ML	9.53	0.1461	Random effects
FL	18.22	0.0057	Fixed effects

Table 7: Result of Breusch-Pagan test

Model	Test statistic	Probability error	Results
ML	1238.22	0.0000	Acceptance of random effects

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Table 8: Result of rate of likelihood test (RL)

Log-likelihood function					
Model	Restricted	Unrestricted	Test statistic	Probability error	Results
Life Expectancy (LE)					
TL	-334.4826 (0.0000)	-218.8335 (0.0000)	χ^2 (S) = 231.3	0.0000	Heteroscedasticity
ML	-315.6314 (0.0000)	-229.4096 (0.0000)	χ^2 (S) = 172.4	0.0000	Heteroscedasticity
FL	-340.9991 (0.0000)	-226.7471 (0.0000)	χ^2 (S) = 228.5	0.0000	Heteroscedasticity
Infant Mortality Rate at age <5 years (IMR)					
TL	-695.1382 (0.0000)	-542.9033 (0.0000)	χ^2 (S) = 304.4	0.0000	Heteroscedasticity
ML	-717.251 (0.0000)	-555.0878 (0.0000)	χ^2 (S) = 324.3	0.0000	Heteroscedasticity
FL	-721.9437 (0.0000)	-531.3765 (0.0000)	χ^2 (S) = 381.1	0.0000	Heteroscedasticity
Health of Drinking Water (HDW)					
TL	-449.9909 (0.0000)	-352.4496 (0.0000)	χ^2 (S) = 195.0	0.0000	Heteroscedasticity
ML	-454.4562 (0.0000)	-358.456 (0.0000)	χ^2 (S) = 192.0	0.0000	Heteroscedasticity
FL	-434.2955 (0.0000)	-342.6226 (0.0000)	χ^2 (S) = 183.3	0.0000	Heteroscedasticity

χ^2 confidence interval 95% (error level 5%). Research findings using STATA (12) Software

Table 9: Result of Wooldridge test

Model	Test statistic	Probability error	Results
Life Expectancy (LE)			
TL	265.941	0.0000	Presence of autocorrelation
ML	217.386	0.0000	Presence of autocorrelation
FL	235.541	0.0000	Presence of autocorrelation
Infant Mortality Rate at age <5 years (IMR)			
TL	882.481	0.0000	Presence of autocorrelation
ML	672.001	0.0000	Presence of autocorrelation
FL	790.674	0.0000	Presence of autocorrelation
Health of Drinking Water (HDW)			
TL	109.950	0.0000	Presence of autocorrelation
ML	110.661	0.0000	Presence of autocorrelation
FL	110.334	0.0000	Presence of autocorrelation

χ^2 is at confidence interval 95% (error level 5%). Research findings using STATA (12) Software

combinatory model versus stochastic effect model. Breusch and Pagan (1979) presented this test for determination of variance heterogeneity

(heteroskedasticity) as well as to identify approximation technique based on stochastic effects. In this test, hypothesis H_1 is based on approval of stochastic effects. To determine the presence of problems caused by heteroskedasticity among disorder sentences and also autocorrelation, Rate of Likelihood test and Wooldridge test were utilized, respectively and their results are reported in Table 8.

The results of Table 9 have confirmed the presence of variance heterogeneity among the disorder elements in model as well as existing first-order autocorrelation. For this reason, Generalized Least Squares test has been adapted to achieve more effective results where their results are reported in Table 10-12. Final estimation of model using Generalized Least Squares (GLS) method.

Table 10: Result of final test (GLS) life expectancy

Explanatory variables	P> Z	z values	Coefficients
Life expectancy model of trade liberalization Model (2-1-1)			
FR	0.0000	-31.88	-4.605
HIV	0.0010	3.24	0.362
LNIN	0.0460	-1.99	-0.158
PU	0.0000	41.08	0.132
HEX	0.0890	1.70	0.006
TL	0.0000	3.94	0.012
CONS	0.0000	33.15	76.89
Wald statistic	π - α λ ν ϵ	6445.73	0.0000
Monetary liberalization model life expectancy Model (2-2-1)			
FR	0.0000	-13.20	-3.058
HIV	0.0000	4.75	0.763
LNIN	0.0000	3.20	0.328
PU	0.0000	38.77	0.153
HEX	0.0000	4.61	0.024
TL	0.0000	4.38	0.0189
CONS	0.0000	19.16	58.027
Wald statistic	π - α λ ν ϵ	2031.89	0.0000
Life expectancy model of financial liberalization-Model (3.2-1)			
FR	0.0000	-33.56	-4.77
HIV	0.0000	4.08	0.454
LNIN	0.3640	-0.91	-0.077
PU	0.0000	44.35	0.137
HEX	0.4550	0.075	0.003
TL	0.0220	2.30	0.007
CONS	0.0000	30.16	75.36
Wald statistic	π - α λ ν ϵ	5661.13	0.0000

Table 11: Result of final test (GLS)-infant mortality rate

Explanatory variables	P> Z	z values	Coefficients
Model of trade liberalization Infant mortality rate at age <5 years, Model (1-3-1)			
FR	0.0000	19.35	20.282
HIV	0.0000	-4.74	-5.778
LNIN	0.8160	0.23	0.08
PU	0.0000	-24.83	-0.744
HEX	0.0000	-5.82	-0.215
TL	0.0000	-4.48	-0.125
CONS	0.0000	-3.77	46.981
Wald statistic	π - α λ ν ϵ	1282.34	0.0000
Monetary liberalization model infant mortality rate at age <5 years, Model (2-3-1)			
FR	0.0000	15.21	17.602
HIV	0.0000	-6.63	-8.983
LNIN	0.8160	0.23	0.131
PU	0.0000	-16.38	-0.797
HEX	0.0010	-3.43	-0.132
ML	0.0010	-3.38	-0.093
CONS	0.0050	2.83	50.701
Wald statistic	π - α λ ν ϵ	98, 535	0.0000
Model of financial liberalization infant mortality rate at age <5 years, Model (3-3-1)			
FR	0.0000	486.79	17.789
HIV	0.1050	1.62	0.094
LNIN	0.0000	-8.94	-0.341
PU	0.0000	-648.87	-0.454
HEX	0.2700	1.10	0.0009
FL	0.0210	-2.31	-0.0015
CONS	0.0000	17.22	19.082
Wald statistic	π - α λ ν ϵ	1491453	0.0000

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Table 12: Result of final test (GLS)-healthy drinking water

Explanatory variables	P> Z	z values	Coefficients
Model of trade liberalization healthy drinking water, Model (1-4-1)			
FR	0.0000	-10.59	-2.374
HIV	0.0000	-7.69	-1.760
LNIN	0.0000	-7.42	-0.779
PU	0.0000	3.81-	0.021-HEX
	0.0000	4.08	0.029
TL	0.0710	1.80	0.011
CONS	0.0000	41.22	122.139
Wald statistic	π - α λ ν ϵ	331.00	0.0000
Monetary liberalization model healthy drinking water, Model (2-4-1)			
FR	0.0000	-20.80	-2.466
HIV	0.0000	6.74	0.633
LNIN	0.0000	-3.79	-0.319
PU	0.0000	5.66	0.022
HEX	0.9550	0.06	0.0001
ML	0.0200	2.33	0.003
CONS	0.0000	47.22	106.774
Wald statistic	π - α λ ν ϵ	1679.70	0.0000
Model of financial liberalization healthy drinking water, Model (3-4-1)			
FR	0.0000	-9.96	-2.383
HIV	0.0000	-7.12	-1.608
LNIN	0.0000	-6.97	-0.686
PU	0.0020	-3.16	-0.017
HEX	0.0000	3.86	0.027
FL	0.98	-0.02	-0.00009
CONS	0.0000	41.03	119.936
Wald statistic	π - α λ ν ϵ	303.13	0.0000

Research findings using STATA (12) software

CONCLUSION

With respect to the issues mentioned in this study, the results obtained from estimation of life-expectancy models indicate that the coefficients for variables of trade, monetary and financial liberalization are positive and statistically significant. Hence, with one unit increase in each of coefficients for variables of trade, monetary and financial liberalization there will be an increase of 0,004, 0.036 and 0.021 units per life expectancy, respectively. Accordingly, it can be concluded that economic liberalization has positive and significant effects on life-expectancy index in the studied countries. Similarly, the effect of economic liberalization elements on infant mortality rate under age 5 based on final estimation of models and the resultant findings from them showed that coefficients of economic liberalization elements were positive and statistically significant. The given results for variables of trade, monetary and financial liberalization signify that one unit increase in value of the given variable has led to reduction in infant mortality rate (under age 5) up to 0.125, 0.093 and 0.0015, respectively. Similarly, results of estimation on healthy drinking water model show that the coefficients of trade and monetary liberalization variables are positive and significant. With respect to the acquired coefficients for these variables, one unit increase in the acquired coefficients leads to rising healthy drinking water up to level of 0.011 and

0.003, respectively. Coefficient of financial liberalization variable is insignificant, so it has no significant effect on healthy drinking water.

SUGGESTIONS

According to the results obtained in this research, based on determination of effect of economic liberalization variables on health indices in a selected group of world petroleum exporting countries, paying attention to these variables and their effect on health parameters may lead to strengthening and purposefulness of decisions made by economists and policymakers in healthcare system. It may also increase their potential in explanation of effective factors on health level and reasons for acquisition of favorable health level by some of the countries. According to the results from this study in order to improve and enhance quantitative and qualitative levels of health indices in the studied countries, some suggestions are proposed.

This group of countries including Iran, may prepare the ground for free trade in monetary, financial and trade sectors by means of their competitive advantages, exchange of information and daily modern technologies for better and more efficient use, quantitative and qualitative upgrading services and Hi-Tech related to the given backgrounds; particularly in health sector. Rising potential of choice for consumers and their satisfaction causes a reduction in costs for rising efficiency and improving their own health parameters by joining World Trade Organization (WTO) and removing custom barriers and facilitation of the rules regarding high tariffs and custom dues simultaneously with correction of infrastructural foundations.

Whereas in developing countries, the role of health sector has been noticeably increased during several recent decades and the greater share of this sector in national product may be mentioned as the reason for this trend. Thus, the given countries are to benefit from their advantages and outcomes such as increasing rate of creating the related jobs to healthcare system and rising human capital of personnel followed by positive impact on productivity of personnel in addition to increase in role of healthcare sector of GDP and rising expenses of medical healthcare from total costs through spending further part of oil revenues in this sector that leads to an increase in supply of workforce and rising life expectancy and reduced mortality as two parameters for the measurement of development in order to improve welfare and to reduce poverty and enhancement of economic growth as well.

The economic potential may be strengthened for families by reformation of structures and infrastructures of economic liberalization as well. Similarly, it is possible for families to pay more attention to health-related issues by training, culture building and adopting polices for reducing governmental costs including establishment of strong private sectors and giving the needed licenses to them in health sectors along with public sectors, reformation of the financial-administrative system and structure, employment of experts and capable manpower, facilitation or deletion of bureaucratic rules and regulations, further healthcare during pregnancy period, improvement in health and suitable nutrition for mothers and neonates and children, training of mothers, vaccination, prevention from interfamilial marriages, expansion of insurance and hospital services, public training for health sectors, upgrading literacy culture and dietary literacy specified to mothers, prevention from overdose in smoking, fat, alcohol, improvement of environment and fighting against ecologic pollutions increase in emergency services and supply of low cost drugs and reduced stresses in social environment. These may be effective in quantitative and qualitative enhancement of health parameters.

It is estimated that about 20-40% of costs in health sector are lost due to lack of required effectiveness and efficiency so that by focusing on sectorial policies, proper and essential definition of strategies in health sector, creating of transparent and appropriate and efficient information management system, rationalization of monetary and financial techniques of financing and use of knowledge-based organizations and employing modern and high technologies and equipment of world in health sector, one can prevent from wasting these resources.

Whereas findings of the present research indicate positive relationship among elements of economic liberalization and health indices in the studied countries, through taking policies and measures for increase of quantitative and qualitative dimension and investment in Research and Development (R&D) sector in the field of healthcare and creation of appropriate infrastructures in accordance with international standards, one can use competitive advantages and exportation of the related products to acquire hard currency in addition to introducing innovations and inventions in this sector.

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