Economic Misery, Urbanization and Life Expectancy in MENA Nations: An Empirical Analysis

Ali, Amjad and Audi, Marc

Lahore School of Accountancy and Finance, University of Lahore City Campus, AOU University/University Paris 1 Pantheon Sorbonne

January 2019

Economic Misery, Urbanization and Life Expectancy in MENA Nations: An Empirical Analysis

Amjad Ali*[1], Marc Audi**
*Lahore School of Accountancy and Finance, University of Lahore City Campus.
**AOU University/University Paris 1 Pantheon Sorbonne.

Abstract
This paper has examined the effect of urbanization and economic misery on average life expectancy in selected MENA nations from 2001 to 2016. The selected MENA nations are: Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen Rep. PP-Fisher Chi-square, Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat and ADF-Fisher Chi-square unit root tests have been used for examining unit root issue in the data. Panel ARDL has been used for reviewing the co-integration among the selected indicators. The causality of the variables has been analyzed by impulse response function and variance decomposition. The outcomes reveal that food availability has significant and positive relation with an average life expectancy. The outcomes show that environmental standards put significant and positive impact on average life expectancy. The outcomes reveal that economic misery has a significant and negative influence on average life expectancy in MENA nations. The findings reveal that urbanization puts significant and positive influence on average life expectancy. So, for improving the average life expectancy in MENA nations availability of food, household final consumption and the level of urbanization must be enhanced. Whereas at the time economic misery will be reduced.
Keywords: Economic misery, urbanization, life expectancy
JEL Codes: E31, O18, J17

Introduction
From last few years, socioeconomic development is measurement with the help of life expectancy (UNDP, 1991). In classical development economics, the central focus is on how much command you have on resources and goods (Anand and Ravallion, 1993). Whereas the modern development economics do not agree on this point of view, as Sen (1983) points out that control on resources and goods is not development, actually development comprises off capabilities decrease hunger, morbidity and mortality. Humans are continuously trying to improve the level of health for long life (Colantonio *et al.*, 2010). Long life expectancy or less mortality rate is considered best indicator to judge a nation's health status, as it is the output of many environmental, social and economic factors. It has been witnessed that life expectancy is rising among different parts of the world. There are number of factors responsible for this rise such as technological advancement, literacy rate, better sanitation, improved water and health facilities (WHO, 2005). Although

[1] Authors are Assistant Professor, Lahore School of Accountancy and Finance, University of Lahore City Campus and Associate Professor, AOU University/University Paris 1 Pantheon Sorbonne.
Corresponding Author: chanamjadali@yahoo.com

developed countries have increased life expectancy at desired level but developing countries still struggling for reasonable level of life expectancy. In past, previous literature considers life expectancy a theme related to demographic, but studies of Kakwani (1993), Grosse and Aufiey (1989) and Preston (1976, 1980) highlight its importance as part of economics. Currently, numerous studies have investigated the socioeconomic and political aspects of life expectancy (Ali and Khalil, 2014; Navarro et al., 2006; Gerring et al., 2005; Franco et al., 2004; Lake and Baum, 2001; Mahfuz, 2008; and Shen and Williamson, 1997).

The rising life expectancy throughout the world is attributed to higher income per capita income, higher level of education, better maternal health cares, improved living environment and improved working condition. Average life expectancy represents the overall health conditions of a nation because it is the combination of many environmental and socioeconomic factors (Navarro et al., 2006; Lake and Baum, 2001; Hertz et al., 1994; Poikolainen and Eskola, 1988; Wolfe, 1986; and Cumper 1984). While studying the determinants of life expectancy much focus is given to health care, income inequality and economic growth (Preston, 1976). But number of other important indicator which have close link to low life expectancy i.e. social security benefits, intergenerational transfers, human capital investment and fertility. Halicioglu (2010) highlight the importance of cost of medical facilities as an indicator of life expectancy.

Preston (1976, 1980) and Kakwani (1993) focus on socioeconomic factors which play a vital part in determining life expectancy of a country. An extensive amount of resources is allotted to health sector by the developed countries and much importance is given to social safety nets, environmental management, sanitation and education. A number of studies highlight that better nutrition, clean drinking water, improved sanitation, higher literacy rate and reduced poverty rate are deciding life expectancy (Ali and Khalil, 2014; Navarro et al., 2006; Gerring et al., 2005; Franco et al., 2004; Lake and Baum, 2001; Mahfuz, 2008; and Shen and Williamson, 1997). Navarro et al. (2006) highlight that rising health expenditure by the masses and improved medical care increases overall life expectancy. This study is going to examine the impact of economic misery and urbanization on average life expectancy in the case of selected MENA nations. The selected MENA nations are: Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen Rep. This type of study is hardly available in previous studies. So, the current study will be a healthy input in respective literature and provides policy options for MENA nations to improve average life expectancy.

Literature Review

Williamson and Boehmer (1997) examine the relationship of female life expectancy, gender stratification, health status and level of economic development in LDCs. Cross-sectional data of 40 developed and 97 less developing countries. For the empirical analysis, multiple regression techniques are used. The study tests the theory of gender stratification for reviewing the life expectancy of female in the case of LDCs. With the help of incremental model, women status has been measured with the help of reproductive autonomy, economic status and educational status.

The study mentions that reproductive autonomy, economic status and educational status have positive impact on overall life expectancy of the selected countries and female life expectancy is also increased in LDCs. Cockerham (1997) analyses the rise of adult mortality in Russia and selected Eastern European countries during the late 20th century. Three explanations for this trend are considered: (1) Soviet health policy, (2) social stress, and (3) health lifestyles. A review of relevant data shows that the socialist states are generally characterized by a persistently poor mortality performance as a part of a long-term process of deterioration, with particularly negative outcomes for the life expectancy of middle-aged male manual workers. Soviet-style health policy is ineffective in dealing with the crisis, and stress does not seem to be the primary cause of the rise in mortality. This study suggests that poor health lifestyles reflect especially in heavy alcohol consumption, and also in smoking, lack of exercise, and high-fat diets are the major social determinant of the upturn in deaths.

Shaw et al., (2005) explore the factors impacting on expected average life in the case of some selected developed countries. For empirical analysis OECD health indicators data has been from 1960 to 1999. OLS and residual maximum likelihood estimates are used for data analysis. Results reveal that the consumption on pharmaceutical has positive relation with middle age and old groups' life expectancy. The study points out that if age distribution is ignored in the process of estimation then pharmaceutical consumption has positive relationship with life expectancy in selected OECD countries. The study mentions, when the amount pharmaceutical is doubled the overall life expectancy by one year. Lin et al. (2005) analysis the impact of social and political indicators on expected average life in developing countries. This study uses 119 countries data from 1970 to 2004 for empirical analysis. Political regime, nutritional status, literacy rate and economic growth are selected explanatory variables, when dependent variable is life expectancy. The study uses OLS method for empirical analysis. The findings of the study show that although democracy has short run positive impact on life expectancy but in the long run democracy has undefined impact on life expectancy. Whereas, socioeconomic and nutritional status have significant long run and short run impact on life expectancy. On the basis of the estimated results, the authors suggest that developing countries has to encourage democratic environment for enhancing overall life expectancy.

Yavari and Mehrnoosh (2006) analyze the impact of socioeconomic aspects on life expectancy. Cross sectional data are used in 89 countries in which 33 from Africa, 17 from Asia, 19 from Latin America and 20 from the rest of the world including European countries, United States and Canada. For empirical analysis, multiple regression estimates are used. Results show that there is a strong positive correlation between life expectancy and per capita income, health expenditures, literacy rate and daily calorie intake while there is a strong negative correlation between life expectancy and the number of people per doctor. Results also describe that expenditure on human development indicators affect the level of life expectancy. The findings of this study suggest that human development requires an increasing investment in the socioeconomic sectors.

Bergh and Nilsson (2010) analyze the relationship among three dimensions (economic, social, and political) of globalization and life expectancy in LDCs. Panel data of 92 countries are used over

the period 1970 to 2005 and used different estimation techniques and sample groupings to analyze the relationship. Findings reveal that economic globalization puts positive influence on overall life expectancy, when number of doctors, literacy rate, nutritional intake and income per capita are used as control variables. The estimated results of the study explain that social and political globalization have insignificant impact on expected average life in selected LDCs. The study concludes that in developing countries, life expectancy can be increased with the help of economic globalization. Halicioglu (2010) investigate the main indicator Turkish life expectancy from 1965 to 2005. This study has divided the selected indicator into three groups i.e. environmental, social and economic indicators. ARDL has been used for estimating the elasticities of the selected variables, the uncertainty and certainty of the selected model has been tested by different stability tests. The estimates of the study show that availability of food and nutrition have positive and significant impact on overall life expectancy in the case of Turkey, whereas smoking has negative impact on life expectancy in Turkey. The estimated outcomes of the study reveal that for long life in Turkey socioeconomic factors play vital role.

Balan and Jaba (2011) investigate the determinants of life expectancy in Romania, by regions. The study uses the data for the 42 Romanian counties in the 8 territorial administrative regions for the year 2008. Panel OLS method has been used for empirical analysis. The estimated results of the study show that libraries subscribers, number of doctors, hospital beds and wage rate have positive and significant impact on life expectancy whereas illiteracy rate and population growth rate have negative impact on life expectancy. Oney (2012) analyses the relationship between health expenditure and health outcomes with the inclusion of lifestyle variables. Data from 33 countries that are members of the Organization of Economic Cooperation and Development (OECD) are used. This study also uses the factors of happiness and satisfaction as a measure of health. To measure the lifestyle variables such as education, alcohol consumption, and tobacco are used. The findings of this study describe that Education has s negative association with both infant mortality and PYL while alcohol consumption has a positive association with infant mortality. And results also show that tobacco is negatively associated with life expectancy and positively associated with PYLL.

Singariya (2013) explores several socioeconomic factors associated with life expectancy at birth and the influencing factors in major states of India. This study uses quantitative secondary data collected from statistical databases. Data are recorded at the state level of fifteen major states of India. For statistical analysis, regression and principal components analysis are used. Results show that there is a close relationship between life expectancy and socioeconomic factors. Findings also show that there is a large inconsistency among states in the analyzed variables. Life expectancy at birth has positive and statistically significant association with both factors extracted from PCA but regression coefficient is higher for the second factor score. These results suggest that an increase in per capita income, monthly per capita consumption expenditure, housing facility, electrification, telephone accessibility would have more positive influence on life expectancy than per capita public expenditure on health and literacy rate. Mahumud et al., (2013) empirically review the impact of health care expenditures and economic growth on life expectancy in the case of

Bangladesh from 1995 to 2011. This study also examines the gender-based life expectancy in Bangladesh. OLS has been used for empirical analysis. The estimated outcomes of the study show that female life expectancy is higher in Bangladesh since las 15 years. The study concludes that health expenditures and economic growth have significant influence on expected average life in Bangladesh. This study suggests for Bangladesh should improve economic growth for achieving desired level of life expectancy. Bayati et al., (2013) estimate production function based on health indicator in the case of East Mediterranean Region (EMR) with the help of Grossman model. The panel data has been used for empirical analysis, either expected average life is influenced by socioeconomic factors. Data from 1995 to 2007 has been used empirical purpose. Fixed effect model has been used for the estimation of the parameters. Results show that the elasticity of life expectancy with respect to the employment rate and its significance level is different between males and females. The results of the study highlight that for improving life expectancy in EMR countries, these countries should improve their health care system and at the same time improve economic conditions as well.

Ali and Ahmad (2014) investigate the impact of CO2 emissions, income per capita, population growth, inflation rate, school enrollment rare and availability of food on expected average life in the case of Sultanate of Oman from 1970 to 2012. ARDL test has been applied for empirical analysis. The outcomes of the study show that school enrollment and availability of food production have positive influence on expected average life in Oman, whereas income per capita, CO2 emissions and inflation rate insignificant impact on life expectancy. The outcomes of the study show that growth of population has inverse impact on life expectancy in Oman. The results of the study suggest that Omani government should improve its socioeconomic conditions for improving level of life expectancy. Monsef and Mehriardi (2015) explore the determinants of expected average life in the case of 136 developed and developing countries from 2002–2010. This study distributes the determinants into three groups environmental, economic and social sector. Panel OLS has been for empirical analysis. The study explains that inflation and unemployment have negative and significant impact on expected average life whereas income has positive impact on expected average life. The main socio-environmental cause of mortality is urbanity. According these results, this study presents a number of recommendations in order to improve life expectancy. Murwirapachena and Mlambo (2015) analysis the effect of socioeconomic factors on life expectancy in the case of Zimbabwe from 1970 to 2012. Population growth, dependency ratio, agriculture land, inflation rate and economic growth are selected socioeconomic indicators in the case of Zimbabwe. Simple OLS has been used for empirical analysi. The estimated findings of the study show that population growth, inflation rate and economic growth have positive impact on life expectancy in Zimbabwe. Dependency ratio and agricultural land have negative impact on life expectancy in Zimbabwe. Shahbaz et al., (2015) investigate the determinants of life expectancy in the presence of economic misery in Pakistan. Time series data are used over the period of 1972-2012. The ARDL has been applied for examining the relationship among the determinants of life expectancy in Pakistan. The estimated findings of the study reveal that health expenditures are improving the life expectancy in the case of Pakistan. The estimates of the study reveal that rising

illiteracy rate and economic misery have negative effect on expected average life whereas urbanization is enhancing overall expected average life in Pakistan. The authors point out that government of Pakistan should reduce economic misery for getting desired level of life expectancy.

Razzak et al., (2015) analyze the influence of some health indicators on expected average life in Asia. Data of 40 countries from Asia is obtained from World Bank. This study constructs an index of health indicator with the help of PCA. Results show that life expectancy at birth is statistically significant and have positive associations with four factors extracted from PCA. However, infant mortality, crude death rare and crude birth rate negative impact on expected average life in Asia.

Audi and Ali (2016) analyze the impact of socioeconomic environment on life expectancy in Lebanon from 1971 to 2014. Population growth, income per capita, school enrollment, CO2 emissions and availability of food are selected socioeconomic indicator of Lebanon. Johansen test has been used for studying the co-integration of the model. The estimated results explain that the existence of co-integration in model. Findings also explain that all independent factors have significant impact on life expectancy in Lebanon. The projected results suggest that if the government of Lebanon wants to increase expected average life, it has to improve its socioeconomic status of its population.

Economic Model and Data Sources

This study explores the impact of availability of food, environmental standard, economic misery, urbanization and household final consumption on average life expectancy in the case of selected MENA nations from 2001 to 2016. Data of selected indicator has been collected from the World Bank. Following the theoretical framework of Ali and Audi (2016), Ali (2015), Ali and Khalil (2014), Fayissa and Gutema (2005) and Grossman (1972), our model becomes as:

$$LIFE=f\ (ENS, MISERY, FOOD, URB, FCON) \quad (1)$$

Where

LIFE= average life expectancy

ENS= environmental standards (CO2 Emission)

MISERY= economic misery (inflation + unemployment)

FOOD=availability of food (food index)

URB= urbanization (population in urban areas)

FCON= household final consumption

The econometric functional form of the model becomes as:

$$LIFEit = \alpha + \beta_1 FOODit + \beta_2 ENSit + \beta_3 MISERYit + \beta_4 URBit + \beta_5 FCONit + \varepsilon_t \quad (2)$$

Where

i= for ith country
ε = stochastic error term
t= time period

Econometric Methodology

Application of econometric methods on macro-economic variables is an imperative feature within numerical economic inquiry. For baseline estimation, ordinary least squares (OLS) method has not been applied. A constraint of this method is that it applies to linear time series data if data is non-linear OLS provides unreliable estimates of the parameters. It means that, the measurements for consideration will not essentially reach near the accurate population parameters on the basis of sample data. Moreover, time series data have the non-stationarity or unit root problem. Nelson and Plosser (1982) discuss that frequency time-series data of macro-economic variables have unit-root issue. Nemours unit root tests are available in applied econometric literature. For examining the stationarity of the data LLC, IPS and ADF-FC unit root tests. Levin et al., (2002) have developed panel unit root with the help of unique specifications. LLC unit root test is based on the homogeneity of the panel unlike others. LLC unit root test follows the procedure of ADF in the process of unit root problem in the data set. The common form of an LLC is as:

$$\Delta y_{i,t} = \gamma_{0i} + p y_{it-1+} \sum_{i-1}^{pi} \gamma_{1i} \Delta y_{i,t-j} + u_{i,t} \quad (3)$$

γ_{0i} is intercept in the equation (3) with having unique across the cross sectional entities and p is identical for the autoregressive coefficient, whereas γ_i denotes for lag order, $u_{i,t}$ is the residual term which has been supposed to be independent for all the across of panel entities. The equation (3) follows the ARMA stationary process for each cross section becomes as:

$$u_{i,t} = \sum_{j-0}^{\infty} \gamma_{1i} \Delta y_{i,t-j} + \varepsilon_{i,t} \qquad (4)$$

Following the equation (4), null and alternative hypotheses can be developed as:

H_0: $p_i = p = 0$

H_a: $p_i = p < 0$ for all i

LLC model is based on t-statistic, where p is supposed to fix across the entities under the null and alternative hypothesis.

$$t_p = \frac{\overset{\Lambda}{p}}{SE(\overset{\Lambda}{p})} \qquad (5)$$

In this whole procedure, we have supposed that the residual series is white noise. Further, the regression of the panel has t_p test statistic, which presents the convergence of standard normal distribution when N and $T \to \infty$ and $\sqrt{\frac{N}{T}} \to 0$. On the other hand, if any sectional unit is not independent, then the residual series are corrected and have issue of autocorrelation. Under such these circumstances LLC test proposes a modified test statistic as:

$$t_p = \frac{t_p - N\tilde{T}\hat{S}_N \hat{\sigma}^{-2}(\hat{p})\mathrm{u}_m^*}{\sigma_m^*} \qquad (6)$$

Where u_m^* and σ_m^* are modified the error term of error term and standard deviation of error term, the values of these are generated from Monte Carlo Simulation by LLC (2002).

Im et al., (2003) develop a panel stationarity test in the case when panel data is heterogenous. this panel unit root test is also based on ADF unit root methodology, but this test is based on the arithmetic mean of individual series, this test is followed as:

$$\Delta y_{i,t} = \bar{w}_i + p y_{it-1+} \sum_{i-1}^{pi} \gamma_{1i} \Delta y_{i,t-j} + v_{i,t} \qquad (7)$$

The IPS test allows for heterogeneity in v_i value, the IPS unit root test equation can be written as:

$$\bar{t}_T = \frac{1}{N} \sum_{i-1}^{N} t_{1,i}(\mathrm{p}_i) \qquad (8)$$

Where $t_{i,t}$ is the ADF test statistic, p_i is the lag order. For the calculation process, this test follows:

$$A_t - - = \frac{\sqrt{N(T)}[\bar{t}_T - \mathrm{E}(\mathrm{t}_T)]}{\sqrt{Var(\mathrm{t}_T)}} \qquad (9)$$

As we have fixed the issue of unit in the data, now long run and short run relationship of the variables can be examined. Pesaran et al., (1999) present pooled mean group test for dynamic panel. Simply PMG test uses average and amalgamates of the coefficients (Peraran et al., 1999). Following the assumptions of pool mean group test, parameters of short term and residual variance

vary for each group, whereas collected long run parameters remain same. The general equation of pooled mean group is as follow:

$$y_{it} = \sum_{j-1}^{p} \lambda_{ii} y_{i,t-j} + \sum_{j-0}^{q} \delta_{ij} X_{i,t-j} + u_t + \varepsilon_{it} \qquad (10)$$

Here, i=1,2,3,4,5,…..N are selected cross section and t=1,2,3,4,5,…..T for time period. X_{it} is a vector of selected independent variables Kx1, λ_{ij} is a scalar, u_i is group specific impact. If the selected indicators are I(1) integrated then residual is an I(0) integrated. The main quality of co-integrated indicators is that they rejoinder any point in long run equilibrium path. This shows that error correction dynamics is existed for selected model. Error correction model is written as:

$$y_{it} = \phi_i y_{i,t-j} - \theta_i X_{i,t-j} \sum_{j-1}^{p-1} \lambda_{ii} \Delta y_{i,t-j} + \sum_{j-0}^{q-1} \delta_{ij} \Delta X_{i,t-j} + u_t + \varepsilon_{it} \qquad (11)$$

Here φ_i error correction parameter, which explains adjustment speed from short run to long run equilibrium. If $\varphi_i = 0$, this reveals the presence of long run relation among variables. For reviewing the convergence between short and long run, φ_i must be negative and significant, this is the necessary and sufficient condition.

Innovative Accounting Technique

In applied econometrics, Nemours methods are available which examine the causal relationship among variables. Granger causality and vector error correction method (VECM) are most widely used for this purpose. There are some demerits with these traditional methods such as: these methods provide only information about the strength of causal relationship with the selected time period and do not provide information out of time span. Moreover, these methods are incompetent to explain the correct degree of response from one variable to another (Shan, 2005). The method of simple Granger causality test cannot provide information about the strength of causal relationship between variables outside of the given time period (Shan, 2005); it also does not provide information about the correct impact of one variable to the other. Under these demerits, the estimated results cannot provide exact information. So this study has employed the innovative accounting approach (IAA) to analysis the causal relationship between each and every pair of the selected variables of the model. The IAA can decompose predicted variance of error, for this purpose, it can use the impulse response function (IRF). Following the methodology of innovative accounting technique, variance decomposition method (VDM) has been developed for examining the causal relationship between variables, VEM provides the correct quantity of shocks which are created by the innovative shocks other variable following different time points.

Variance decomposition uses the variation in the series by its own shocks and shocks from others variables and this provides the strength of the impact in the series (Enders, 1995). A unique set of formulation is applied for analyzing the effect of a single standard deviation shock due to another factor and this also provides the forthcoming shock trend in data (Shan, 2005). For example, if the shock in economic uncertainty impacts money demand significantly, but vice versa is minimal.

So, it is concluded that unidirectional causality exists from economic uncertainty in money demand. If economic uncertainty provides information about the error of money demand, then we can conclude that economic uncertainty causes money demand in Pakistan. The bidirectional causal relationship exists if both variables explain each other. But on the other hand, if both variables contribute less in explaining the shocks of each other than there exists no-causal relationship among indicators.

Impulse response function provides information about the time path while impacts one variable to another. On these bases, a person can easily understand the response of economic uncertainty due to its own shocks and money demand. Economic uncertainty causes money demand if the impulse response function shows substantial reaction of money demand to shocks in economic uncertainty. A robust and substantial response of economic uncertainty to shocks in money demand suggests that money demand Granger cause economic uncertainty.

A VAR system takes the following form:

$$V_t = \sum_{i=1}^{k} \delta_i V_{t-1} + \eta_t$$

where, $V_t = (E_t, F_t, \mathrm{Y}_t, A_t, M_t)$

$\eta_t = (\eta_C, \eta_F, \eta_\mathrm{Y}, \eta_E, \eta_{EX})$

$\delta_1 - \delta_k$ are four by four matrices of coefficients, and η is a vector of error terms.

Empirical Results and Discussions

This article has tried to examine the elements of expected average life in case of MENA nations from 2001 to 2016. For this purpose, availability of food, environmental standards, economic misery, urbanization and household final consumption are selected explanatory variables whereas average life expectancy is dependent variable. For examining the intertemporal properties of the selected data, the descriptive statistical analysis is used. The estimates of descriptive statistic are presented in table-1. Descriptive statistic summary provides us value of Mean, Median, Maximum, Minimum, Standard Deviation, Skewness and Kurtosis. Outcomes reveal that there is much variation between the maximum and minimum value of all the selected variables in the model. The outcomes show that economic misery has a minimum value in negative and the maximum value of positive, this is the most vibrant variable in the model. The estimated results in the table-1 reveal that life expectancy, economic misery and urbanization are negatively skewed whereas the availability of food, environmental standards and household final consumption are positively skewed. The results reveal that average life expectancy, availability of food, environmental standards, economic misery, urbanization and final consumption have positive kurtosis. The estimated results reveal that data of selected variables are fulfilling the necessary requirements of intertemporal properties of the data.

Table-1
Descriptive Statistic

	LIFE	FOOD	ENS	MISERY	URB	CON
Mean	73.58716	2.030639	4.830404	15.92179	74.03631	10.72049
Median	74.03757	2.016929	4.800861	15.72208	78.85900	10.65022
Maximum	82.15366	2.319158	5.808793	52.99654	99.24400	11.66274
Minimum	60.67668	1.817301	4.129805	-24.42701	26.78700	9.759919
Std. Dev.	4.243344	0.083851	0.446151	12.62157	18.45306	0.453205
Skewness	-0.871148	0.537761	0.453878	-0.155096	-0.789322	0.010027
Kurtosis	4.298325	3.903955	2.333629	3.917808	2.999559	2.176555
Jarque-Bera	47.21245	19.73880	12.68071	9.385904	24.92115	6.784640
Sum	17660.92	487.3535	1159.297	3821.229	17768.71	2572.917
Sum Sq. Dev.	4303.426	1.680407	47.57303	38073.68	81383.19	49.08942
Observations	240	240	240	240	240	240

Correlation examines statistical relationships involving dependence, though in common usage it most often refers to how close two variables are to having a relationship with each other. Correlations are useful because they can indicate a predictive relationship that can be exploited in practice. The outcomes of the correlations are offered in table-2. The estimates reveal that availability of food has positive and insignificant correlation with an expected average life in MENA nations. The estimates point out that environmental standards have positive, but insignificant correlation with an average life expectancy and availability of food. The estimates show that economic misery has significant and negative correlation with an expected average life and availability of food in MENA. The economic misery has positive but insignificant correction with environmental conditions. The results point out that urbanization has positive and significant correlation with an average life expectancy. The estimates show that urbanization has positive but insignificant correlation with availability of food and environmental standards. The results point out that urbanization has negative and significant correlation with economic misery. The results show that household final consumption has positive and significant correlation with an average life expectancy and environmental standards, but it has a positive but insignificant correlation with availability of food. The estimated results of the study reveal that household final consumption has negative and insignificant correlation with economic misery and urbanization in case of MEAN nations. Overall, results of correlation matrix show that all selected explanatory factors have not very strong correlation, so there are less chances of high multi-collinearity among explanatory factors.

Table-2
Correlation Matrix

Sample: 2001 2015 Included observations: 240						
Probability	LIFE	FOOD	ENS	MISERY	URB	CON
LIFE	1.000000 -----					
FOOD	0.020175 0.7558	1.000000 -----				
ENS	0.025249 0.6971	-0.033870 0.6016	1.000000 -----			
MISERY	-0.409515 0.0000	-0.182994 0.0045	0.057947 0.3714	1.000000 -----		
URB	0.817588 0.0000	0.058350 0.3681	0.016763 0.7961	-0.442199 0.0000	1.000000 -----	
CON	0.164748 0.0106	0.025156 0.6982	0.819253 0.0000	-0.026003 0.6886	-0.017416 0.7884	1.0000 -----

This is necessary that variables of the selected model should be stationary, if your ultimate objective is to examine conitegration among the variables. This article applies Im, Pesaran and Shin W-stat, Levin, Lin & Chu t*, PP-Fisher Chi-square, ADF - Fisher Chi-square unit root tests for examining the stationarity. The results of unit root tests are given in the table-3. The estimated results of Levin, Lin & Chu t*, ADF - Fisher Chi-square and PP - Fisher Chi-square tests reveal that average life expectancy is stationary at level. The results of Im, Pesaran show that average life expectancy is not stationary at level. The estimated results of PP - Fisher Chi-square and Levin, Lin & Chu t* unit root tests reveal that availability of food is stationary at level. The results of Im, Pesaran and Shin W-stat and ADF - Fisher Chi-square unit root tests show that availability of is not stationary at level. The results of Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat and PP - Fisher Chi-square unit root tests show that economic misery is stationary at level. But the results of ADF - Fisher Chi-square unit root test reveal that economic misery is not stationary at level. The results of Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat and ADF - Fisher Chi-square unit root tests results show that urbanization is non-stationary at level. The results of PP - Fisher Chi-square unit root tests reveal that urbanization is stationary at level. The estimated results of Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square unit root tests show that average life expectancy, availability of food, environmental standards, economic misery, urbanization and household final consumption are stationary at first differences. The overall results of unit root tests reveal that there is a mixed order of integration among the selected variables of the model. This is the best situation for applying panel ARDL.

Table-3
Unit Root Tests Results

Variables	Test	Statistic	Prob**	Cross-Section	Obs
Life I(0)	Levin, Lin & Chu t*	-2.81566	0.0024	16	195
	Im, Pesaran and Shin W-stat	0.95288	0.8297	16	195
	ADF - Fisher Chi-square	63.3841	0.0008	16	195
	PP - Fisher Chi-square	131.466	0.0000	16	224
FOOD I(0)	Levin, Lin & Chu t*	-2.63466	0.0042	16	208
	Im, Pesaran and Shin W-stat	0.15638	0.5621	16	208
	ADF - Fisher Chi-square	34.1684	0.3639	16	208
	PP - Fisher Chi-square	53.3845	0.0102	16	224
ENS I(0)	Levin, Lin & Chu t*	-3.28720	0.0005	16	208
	Im, Pesaran and Shin W-stat	0.55527	0.7106	16	208
	ADF - Fisher Chi-square	24.3740	0.8306	16	208
	PP - Fisher Chi-square	23.2238	0.8711	16	224
MISERY I(0)	Levin, Lin & Chu t*	-2.13043	0.0166	16	208
	Im, Pesaran and Shin W-stat	-1.44269	0.0746	16	208
	ADF - Fisher Chi-square	38.4614	0.2002	16	208
	PP - Fisher Chi-square	91.9843	0.0000	16	224
URB I(0)	Levin, Lin & Chu t*	10.6938	1.0000	16	203
	Im, Pesaran and Shin W-stat	7.02980	1.0000	16	203
	ADF - Fisher Chi-square	25.5125	0.7848	16	203
	PP - Fisher Chi-square	115.623	0.0000	16	224
CON I(0)	Levin, Lin & Chu t*	-6.10953	0.0000	16	208
	Im, Pesaran and Shin W-stat	-1.15313	0.1244	16	208
	ADF - Fisher Chi-square	37.8982	0.2181	16	208
	PP - Fisher Chi-square	62.2179	0.0011	16	224
dLife I(1)	Levin, Lin & Chu t*	-14.4133	0.0000	16	188
	Im, Pesaran and Shin W-stat	-16.0795	0.0000	16	188
	ADF - Fisher Chi-square	219.005	0.0000	16	188
	PP - Fisher Chi-square	58.3226	0.0030	16	208
dFOOD I(1)	Levin, Lin & Chu t*	-4.53308	0.0000	16	192
	Im, Pesaran and Shin W-stat	-4.53483	0.0000	16	192
	ADF - Fisher Chi-square	80.0543	0.0000	16	192
	PP - Fisher Chi-square	203.952	0.0000	16	208
dENS I(1)	Levin, Lin & Chu t*	-5.93637	0.0000	16	192
	Im, Pesaran and Shin W-stat	-4.22236	0.0000	16	192
	ADF - Fisher Chi-square	81.9956	0.0000	16	192
	PP - Fisher Chi-square	146.411	0.0000	16	208

dMISERY I(1)	Levin, Lin & Chu t*	-10.3425	0.0000	16	192
	Im, Pesaran and Shin W-stat	-8.46705	0.0000	16	192
	ADF - Fisher Chi-square	128.555	0.0000	16	192
	PP - Fisher Chi-square	300.442	0.0000	16	208
dURB I(1)	Levin, Lin & Chu t*	-8.72109	0.0000	16	201
	Im, Pesaran and Shin W-stat	-2.20149	0.0139	16	201
	ADF - Fisher Chi-square	60.9108	0.0015	16	201
	PP - Fisher Chi-square	37.7873	0.0218	16	208
dCON I(1)	Levin, Lin & Chu t*	-2.37453	0.0088	16	192
	Im, Pesaran and Shin W-stat	-2.70522	0.0034	16	192
	ADF - Fisher Chi-square	54.5181	0.0078	16	192
	PP - Fisher Chi-square	74.5390	0.0000	16	208

This study examines the impact of availability of food, environmental standards, economic misery, urbanization and household final consumption on average life expectancy in case of MENA nations such as Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen Rep. over the period of 2011 to 2016. Normally, LR, FPE, AIC, SC and HQ methods are used for lag order selection. The results of VAR are presented in table-4. On the basis of LR, FPE, AIC and HQ maximum 8 lag length are selected for the model of this study.

Table-4
VAR Lag Order Selection Criteria

Endogenous variables: LIFE FOOD ENS MISERY URB CON
Exogenous variables: C
Sample: 2001 2016
Included observations: 112

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1087.407	NA	12.15651	19.52512	19.67076	19.58421
1	341.4493	2679.106	1.92e-10	-5.347310	-4.327872	-4.933692
2	825.1832	855.1723	6.51e-14	-13.34256	-11.44932*	-12.57441
3	898.6367	121.9853	3.38e-14	-14.01137	-11.24433	-12.88869
4	936.1091	58.21611	3.38e-14	-14.03766	-10.39682	-12.56046
5	982.1958	66.66102	2.94e-14	-14.21778	-9.703132	-12.38604
6	1057.700	101.1218	1.55e-14	-14.92322	-9.534762	-12.73695
7	1110.561	65.13242	1.26e-14	-15.22431	-8.962050	-12.68351
8	1204.076	105.2041*	5.15e-15*	-16.25136*	-9.115296	-13.35603*

* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion

The long run outcomes of panel ARDL bound testing method are given in the table-5. The long run outcomes reveal that availability of food has positive and significant relation with an average life expectancy in MENA nations. The estimates reveal that 1 % rise of availability of food permits (3.972581) % rise in average life expectancy. The outcomes show that environmental standards put significant and positive impact on average life expectancy in MENA nations. The results reveal that 1 % rise in environmental standards permits (4.739078) % rise in average life expectancy in MENA nations. The outcomes reveal that economic misery has a significant and negative influence on average life expectancy in MENA nations. This estimate reveals that 1 % rise in economic misery brings (-0.016073) % fall average life expectancy in MENA nations. The outcomes reveal that urbanization puts significant and positive influence on average life expectancy in MENA nations. The outcomes show that 1 % rise in urbanization brings (0.404022) a % rise in average life expectancy in MENA nations. The estimated findings of the long run show that household final consumption has a positive and significant impact on average life expectancy in MENA nations. The results show that 1 % increase in household final consumption increases the average life expectancy by (0.939400) % in average life expectancy in MEAN nations. The overall long run outcomes reveal that availability of food, environmental standards, urbanization and household final consumption are enhancing average life expectancy in MENA nations (Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, Yemen Rep.) over the selected time period. But economic misery is reducing average life expectancy in MENA nations.

Table-5

Long Run Results Dependent Variable: LIFE Method: ARDL Sample: 2001 2016 Selected Model: ARDL(1, 1, 1, 1, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FOOD	3.972581	0.280604	14.15724	0.0000
ENS	4.739078	0.375337	12.62619	0.0000
MISERY	-0.016073	0.001787	-8.992430	0.0000
URB	0.404022	0.012356	32.69884	0.0000
CON	0.939400	0.148614	6.321073	0.0000

After exploring the long run relationship among the variables of the model, now with the help of ECT, the short run dynamic of the variables can be examined. The outcomes of short run dynamic are presented in table-6. The outcomes of the short run dynamic reveal that availability of food and household final consumption have a positive and significant impact on average life expectancy. The results reveal that environmental standards have a negative, but insignificant relationship with an average life expectancy in the short run. Economic misery has negative and significant relationship with an average life expectancy in the short run. Urbanization has a positive, but insignificant impact on average life expectancy in the case of the selected panel (Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, Yemen Rep.) over the selected time period. ECT show the convergence from short run towards long run. The outcomes reveal that the coefficient of ECT is theoretically correct. This certifies that long run relation of the variables. ECT result reveals that 15 % short deviations are corrected towards the equilibrium path in the very next year. The results show that short run needs six years and six months for complete convergence in the long.

Table-6

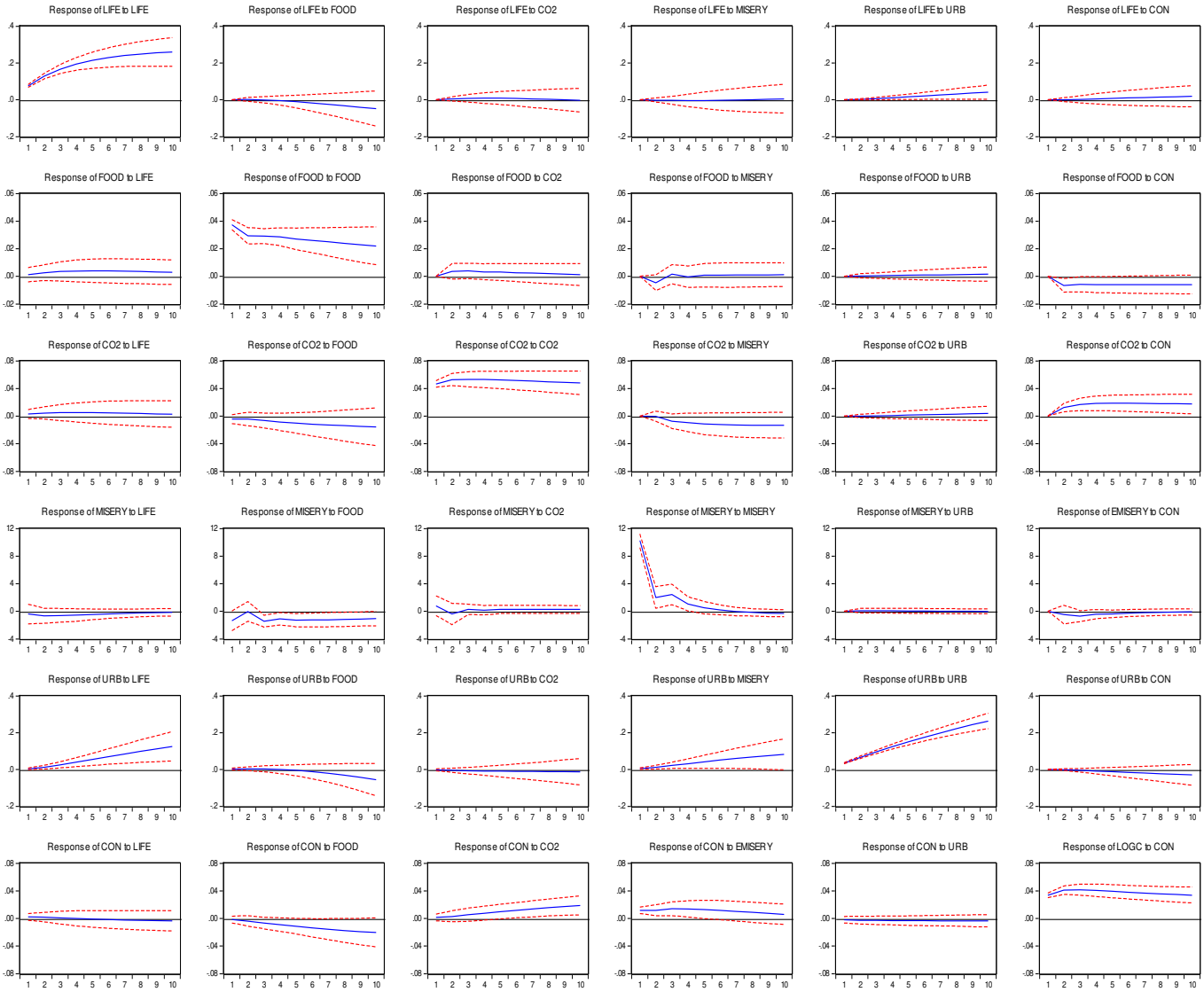
Short Run Dynamics				
COINTEQ01	-0.151470	0.026244	-5.770160	0.0063
D(FOOD)	0.423706	0.200779	2.110780	0.0473
D(ENS)	-0.079184	0.123643	-0.640423	0.5230
D(MISERY)	-0.102470	0.012853	-7.972457	0.0081
D(URB)	0.093885	1.520128	0.061762	0.9508
D(CON)	0.197125	0.086432	2.280694	0.0400
Mean dependent var 0.209933 S.D. dependent var 0.130835 S.E. of regression 0.057213 Akaike info criterion -4.378460 Sum squared resid 0.454990 Schwarz criterion -2.913692 Log likelihood 626.4153 Hannan-Quinn criter. -3.788266				

There are number of causality tests available and they examine the causal relationship among variable. But in this paper impulse response function and variance decomposition analysis are used for this purpose. The results of the impulse response function are given in figure-1. The results indicate that the response of average life expectancy due to forecast error stemming in availability of food is negative throughout the whole time period. The results show that the response of average life expectancy due to forecast error stemming in environmental standards and economic misery is neutral but positive during the selected time horizons. The results reveal that the response of average life expectancy due to forecast error stemming in urbanization initially it is neutral, but after a 4th time horizon it starts rising and remains positive till end. The results indicate that the response of average life expectancy due to forecast error stemming in household final

consumption, till the 6th time horizon, it is neutral, afterward it is positive and stable till end. The results show that the response of availability of food due to forecast error stemming in average life expectancy, it is positive and stable during the whole selected time horizons. The results show that the response of availability of food due to forecast error stemming in environmental standards, initially it is neutral, after 2nd time horizon it is positive and stable till end. The response of availability of food due to forecast error stemming of economic misery, initially it is negative, but after 2nd time horizon, it is neutral and positive during the whole time period. The response of availability of food due to forecast error stemming of urbanization, initially it is neutral, but after a 5th time horizon it becomes positive till end. The response of availability of food due to household final consumption is negative and stable during the whole time period. The response of environmental standards due to average life expectancy is positive and stable during the selected time period. The of environmental standards due to availability of food and economic misery is negative and stable during the entire time range. The response of environmental standards due to error stemming of urbanization, initially it is neutral, but after a 4th time horizon it becomes positive and stable. The results show that the reaction of environmental standards due to household final consumption, initially it is neutral, but after 2nd time horizon it is positive and stable during whole time period. The results indicate that the response of economic misery due to forecast error stemming in average life expectancy, initially it is negative, but after a 5th time horizon it is neutral during whole time period. The results reveal that the response of economic misery due to forecast error stemming in availability of food, it is negative and more or less stable during the whole-time range. The response of economic misery due to forecast error stemming of environmental standards, urbanization and household final consumption is neutral during the selected time horizon. The response to urbanization due to error stemming of average life expectancy initially it is neutral, but after 2nd time horizon it is rising positively till end. The results reveal that the response of urbanization due to error stemming in availability of food, initially it is neutral, but after a 5th time horizon it becomes negative and decreasing till end. The results show that the response of urbanization due to error stemming of environmental standards is neutral throughout the selected time horizon. The results indicate that the response of urbanization due to error stemming of household final consumption, initially it is neutral, but after a 5th time horizon it becomes negative till end. The result shows that the response of household final consumption due to error stemming of average life expectancy and urbanization, it is neutral throughout the selected time horizon. The results show that household final consumption responses to the availability of food, initially neutral, but after a 5th time horizon, it becomes negative and remains stable negative till end. The results show that household final consumption responses to environmental standards, initially it is neutral, but over the 22nd time horizon it becomes positive and rising till the end. The results indicate that household final consumption response to error stemming in economic misery, it is positive, but fluctuates throughout the whole time period. The overall impulse response function results reveal that most of the variables are causing average life expectancy in case of MENA nations during the selected time.

Figure-1

Response to Cholesky One S.D. Innovations ± 2 S.E.



The results of variance decomposition are presented in table-7. The estimated results point out that 97.07 percent variation in average life expectancy is described by its personal innovative shocks while innovative shocks of availability of food contribute to average life expectancy by 1.33 percent. The role of environmental standards, economic misery and household final consumption is minimal. These factors by their shocks contribute to average life expectancy in MENA nations by 0.071 percent, 0.019 percent and 0.258 percent respectively. The involvement of urbanization to average life expectancy variations is 1.241 percent. The estimated results explain that average life expectancy contributes to the availability of by 1.37 percent. The estimates show that 93.16 percent, shocks in availability of food are explained by its own innovative shocks while 4.13 percent, shocks in availability of food are explained by household final consumption. The role of

environmental standards, economic misery, and urbanization is very minimal. These factors by their shocks contributes to the availability of food in MENA nations by 0.84 percent, 0.37 percent, 0.111 percent respectively.

The estimated results reveal that 0.56 percent variation in environmental standards is explained by average life expectancy. The results show that 3.90 percent, shocks in environmental standards are explained by the availability of food. The results show that 82.92 percent, shocks in environmental standards are explained by its own innovative shocks. The results show that economic misery contributes to 3.55 percent in explaining environmental standards, whereas urbanization contributes only 0.15 percent in explaining environmental standards. The results show that 8.90 percent variation in environmental standards is explained by household final consumption in MENA nations during the selected time period. The estimates reveal that 1.34 percent, shocks in economic misery are explained by average life expectancy. Availability of food is playing a significant role in shocks of economic misery and it contributes 10.1 percent. The results show that 86.50 percent, shocks in economic misery are explained by itself. The estimated results reveal that environmental standards, urbanization and household final consumption have a minimal contribution in explaining economic misery. They contribute 1.02 percent, 0.02 percent and 0.88 percent respectively. Average life expectancy is explaining 14.08 percent, shocks of urbanization. The results show that 1.62 percent, shocks in urbanization are explained by the availability of food. The estimates highlight that 6.76 percent shocks in urbanization are explained by economic misery. The results reveal that 76.53 percent, shocks in urbanization are explained by its own innovative shocks. The role of environmental standards and household final consumption is very minimal in explaining shocks of urbanization. They contribute 0.2 percent and 0.75 percent respectively.

The results show that availability of food, environmental standards and economic misery are significantly contributing in shocks of household final consumption. They contribute to 9.54 percent, 7.50 percent and 6.62 percent respectively. The results reveal that average life expectancy and urbanization contribute very minimal in explaining household final consumption. The estimated show that 75.56 percent, shocks in household final consumption are explained by its own innovative shocks.

The overall of results of the impulse response function and variance decomposition reveal that there is a feedback effect between average life expectancy and availability of food, there is bidirectional causality is running average life expectancy and availability of food. The results reveal that there is no causal relationship between average life expectancy and environmental standards in case of MENA nations. There is unidirectional causality is running from an average life expectancy to economic misery and from an average life expectancy to urbanization. There is no causal relationship between household final consumption. Unidirectional causality is running from availability of food to environmental standards, from availability of food to economic misery and from the availability of food to urbanization in MENA nations. The bidirectional causal relationship is existed between household final consumption and availability of food. There is unidirectional causality is running from economic misery to environmental standards. There is no causal relationship between urbanization and environmental standards, but bidirectional causality

is running between environmental standards and household final consumption in MENA nations. Unidirectional causality is running from economic misery to urbanization and from economic misery to household final consumption. There is no causal relationship between urbanization and household final consumption in MENA nations.

Table-7

Variance Decomposition of LIFE:							
Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	0.075184	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.148986	99.84991	0.010353	0.090047	0.025325	0.024141	0.000226
3	0.223820	99.70969	0.006002	0.159909	0.032801	0.083827	0.007773
4	0.296782	99.55091	0.029909	0.180025	0.034075	0.176579	0.028499
5	0.366757	99.34029	0.099086	0.171386	0.031118	0.299851	0.058268
6	0.433470	99.05856	0.222329	0.149653	0.025496	0.450232	0.093728
7	0.497038	98.69452	0.404896	0.124439	0.019768	0.623805	0.132573
8	0.557746	98.24274	0.650188	0.101278	0.015973	0.816342	0.173482
9	0.615940	97.70218	0.959935	0.083057	0.015546	1.023549	0.215731
10	0.671965	97.07485	1.334694	0.071046	0.019254	1.241235	0.258916
Variance Decomposition of FOOD:							
Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	0.037521	0.097816	99.90218	0.000000	0.000000	0.000000	0.000000
2	0.048490	0.347068	96.32850	0.543944	0.934162	0.004321	1.842003
3	0.057149	0.620306	95.40849	0.859641	0.743725	0.007669	2.360173
4	0.064393	0.844822	94.89828	0.926081	0.588918	0.014130	2.727766
5	0.070312	1.029975	94.42576	0.971155	0.507082	0.023330	3.042702
6	0.075424	1.165983	94.08711	0.967668	0.451198	0.035525	3.292518
7	0.079827	1.262292	93.79761	0.948075	0.416802	0.050730	3.524487
8	0.083677	1.324693	93.55660	0.917112	0.394902	0.068711	3.737982
9	0.087068	1.360036	93.34765	0.880694	0.380964	0.089214	3.941447
10	0.090076	1.374168	93.16134	0.842250	0.372880	0.111895	4.137468
Variance Decomposition of ENS:							
Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	0.046911	0.394739	0.874144	98.73112	0.000000	0.000000	0.000000
2	0.072092	0.545519	0.713949	95.81025	0.001234	1.35E-05	2.929038
3	0.091812	0.626807	0.922543	92.65542	0.651211	0.002494	5.141529

4	0.108472	0.668662	1.314947	90.27570	1.187124	0.009391	6.544177
5	0.122916	0.683314	1.709910	88.38078	1.767342	0.021410	7.437246
6	0.135744	0.679351	2.137327	86.87995	2.264040	0.038425	8.000903
7	0.147289	0.662205	2.571100	85.64996	2.682930	0.060137	8.373668
8	0.157798	0.635895	3.012027	84.61239	3.030665	0.086220	8.622802
9	0.167444	0.603679	3.457271	83.71545	3.316601	0.116324	8.790678
10	0.176362	0.568225	3.905431	82.92190	3.552127	0.150109	8.902207

Variance Decomposition of MISERY:

Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	10.37138	0.144188	1.758576	0.604017	97.49322	0.000000	0.000000
2	10.60383	0.517606	1.682406	0.713770	96.88174	0.009506	0.194969
3	11.01689	0.779044	3.270357	0.730520	94.61003	0.016900	0.593145
4	11.14507	1.000772	4.158165	0.735112	93.35487	0.022351	0.728734
5	11.25190	1.146875	5.414993	0.776381	91.80987	0.025566	0.826318
6	11.33663	1.239260	6.568195	0.825293	90.47306	0.026932	0.867262
7	11.41271	1.293376	7.643479	0.877389	89.27238	0.027226	0.886151
8	11.48222	1.322435	8.612911	0.929531	88.21578	0.027008	0.892339
9	11.54519	1.336134	9.465621	0.977967	87.30143	0.026721	0.892126
10	11.60194	1.340656	10.21189	1.022043	86.50995	0.026665	0.888796

Variance Decomposition of URB:

Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	0.034482	0.883270	0.478695	0.429714	1.755324	96.45300	0.000000
2	0.076221	2.797271	0.308290	0.499278	2.830894	93.50424	0.060024
3	0.126585	4.862097	0.159081	0.469240	3.939442	90.39947	0.170666
4	0.184036	6.823740	0.075295	0.420425	4.830029	87.56160	0.288907
5	0.247408	8.579841	0.076741	0.371735	5.508403	85.06418	0.399097
6	0.315764	10.10121	0.176845	0.329395	6.001727	82.89487	0.495951
7	0.388345	11.39224	0.382221	0.294381	6.344549	81.00750	0.579107
8	0.464536	12.47133	0.694269	0.266098	6.569162	79.34947	0.649668
9	0.543837	13.36159	1.110732	0.243561	6.702208	77.87278	0.709132
10	0.625839	14.08652	1.626845	0.225792	6.764943	76.53695	0.758948

Variance Decomposition of CON:

Period	S.E.	LIFE	FOOD	ENS	MISERY	URB	CON
1	0.035728	0.380211	0.224627	0.158025	10.94861	0.293975	87.99455

2	0.055821	0.263781	0.550175	0.326604	8.845492	0.334313	89.67964
3	0.071604	0.177211	1.238053	0.757766	9.222044	0.367470	88.23746
4	0.084357	0.127715	2.027626	1.330635	9.279933	0.398719	86.83537
5	0.095222	0.109414	3.030469	2.079277	9.142275	0.427220	85.21134
6	0.104830	0.114663	4.178383	2.972263	8.805872	0.452822	83.47600
7	0.113578	0.136235	5.443828	3.987689	8.330669	0.475188	81.62639
8	0.121724	0.168219	6.784898	5.098399	7.779258	0.494084	79.67514
9	0.129434	0.206149	8.163764	6.277449	7.198664	0.509404	77.64457
10	0.136820	0.246817	9.547850	7.500123	6.623889	0.521150	75.56017
Cholesky Ordering: LIFE FOOD ENS MISERY URB CON							

Conclusions

This article has explored the effect of economic misery and urbanization on average life expectancy in selected MENA nations from 2001 to 2016. Food Availability, environmental standards, urbanization and household final consumption are selected explanatory variables, whereas average life expectancy is used as the dependent variable. The selected MENA nations are: Algeria, Bahrain, Egypt, Iraq, Iran, Islamic Rep., Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen Rep. Panel ARDL has been used for co-integration. Causality has been checked with the help of the impulse response function and variance decomposition. The outcomes reveal that food availability has significant and positive relation with an average life expectancy. The outcomes show that environmental standards put significant and positive impact on average life expectancy. The outcomes reveal that economic misery has a significant and negative influence on average life expectancy in MENA nations. The findings reveal that urbanization puts significant and positive influence on average life expectancy. The estimated findings show that household final consumption has a positive and significant impact on average life expectancy. The results show that bidirectional causality is running average life expectancy and availability of food. There is unidirectional causality is running from an average life expectancy to economic misery and from an average life expectancy to urbanization. Unidirectional causality is running from availability of food to environmental standards, from availability of food to economic misery and from the availability of food to urbanization in MENA nations. The bidirectional causal relationship is existed between household final consumption and availability of food. There is unidirectional causality is running from economic misery to environmental standards. Bidirectional causality is running between environmental standards and household final consumption in MENA nations. Unidirectional causality is running from economic misery to urbanization and from economic misery to household final consumption. The outcomes reveal that availability of food, environmental standards, urbanization and household final consumption are enhancing average life expectancy in MENA nations over the selected time period. But economic misery is reducing average life expectancy in MENA nations. So, for improving the average life expectancy in MENA nations availability of

food, household final consumption and the level of urbanization must be enhanced. Whereas at the time economic misery will be reduced.

References

Ali, A., & Ahmad, K. (2014). The Impact of Socio-Economic Factors on Life Expectancy in Sultanate of Oman: An Empirical Analysis. *Middle-East Journal of Scientific Research*, *22*(2), 218-224.

Ali, A. (2015). The impact of macroeconomic instability on social progress: an empirical analysis of Pakistan (Doctoral dissertation, National College of Business Administration & Economics Lahore).

Ali, A., & Audi, M. (2016). The Impact of Income Inequality, Environmental Degradation and Globalization on Life Expectancy in Pakistan: An Empirical Analysis. *International Journal of Economics and Empirical Research (IJEER)*, *4*(4), 182-193.

Anand, S., & Ravallion, M. (1993). Human development in poor countries: on the role of private incomes and public services. *Journal of economic perspectives*, *7*(1), 133-150.

Balan, C., & Jaba, E. (2011). Statistical analysis of the determinants of life expectancy in Romania. *Romanian Journal of Regional Science*, *5*(2), 25-38.

Bayati, M., Akbarian, R., & Kavosi, Z. (2013). Determinants of life expectancy in eastern mediterranean region: a health production function. *International journal of health policy and management*, *1*(1), 57.

Bergh, A., & Nilsson, T. (2010). Good for living? On the relationship between globalization and life expectancy. *World Development*, *38*(9), 1191-1203.

Cockerham, W. C., Rutten, A., & Abel, T. (1997). Conceptualizing contemporary health lifestyles. *The Sociological Quarterly*, *38*(2), 321-342.

Colantonio, A., Harris, J. E., Ratcliff, G., Chase, S., & Ellis, K. (2010). Gender differences in self-reported long-term outcomes following moderate to severe traumatic brain injury. *BMC neurology*, *10*(1), 102.

Cumper, G. E. (1984). *Determinants of health levels in developing countries*. Research Studies Press Ltd.

Enders, W. (2008). *Applied econometric time series*. John Wiley & Sons.

Fayissa, B., & Gutema, P. (2005). Estimating a health production function for Sub-Saharan Africa (SSA). *Applied Economics*, *37*(2), 155-164.

Franco, A., Alvarez-Dardet, C., & Ruiz, M. T. (2004). Effect of democracy on health: Ecological study. *British Medical Journal, 329*(7480), 1421–1423.

Gerring, J., Bond, P., Barndt, W. T., & Moreno, C. (2005). Democracy and economic growth: A historical perspective. *World Politics*, *57*(3), 323-364.

Grosse, R. N., & Auffrey, C. (1989). Literacy and health status in developing countries. *Annual Review of Public Health*, *10*(1), 281-297.

Grossman, M. (1972). The demand for health: a theoretical and empirical investigation. *NBER Books*.

Halicioglu, F. (2010). Modelling life expectancy in Turkey. MPRA Paper No. 30840.

Hertz, E., Hebert, J. R., & Landon, J. (1994). Social and environmental factors and life expectancy, infant mortality, and maternal mortality rates: Results of a cross-national comparison. *Social Science and Medicine, 39*, 105–114.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, *115*(1), 53-74.

Kakwani, N. (1993). Poverty and economic growth with application to Cote d'Ivoire. *Review of Income and Wealth*, *39*(2), 121-139.

Lake, D. A., & Baum, M. A. (2001). The invisible hand of democracy: political control and the provision of public services. *Comparative political studies*, *34*(6), 587-621.

Lake, D. A., & Baum, M. A. (2001). The invisible hand of democracy: political control and the provision of public services. *Comparative political studies*, *34*(6), 587-621.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, *108*(1), 1-24.

Lin, C. C., Rogot, E., Johnson, N. J., Sorlie, P. D., & Arias, E. (2003). A further study of life expectancy by socioeconomic factors in the National Longitudinal Mortality Study. *Ethnicity & disease*, *13*(2), 240-247.

Mahfuz, K. (2008). Determinants of life expectancy in developing countries. *Journal of Developing Areas, 41*(2), 185–204.

Mahmud, W., Asadullah, M., & Savoia, A. (2013). Bangladesh's achievements in social development indicators: explaining the puzzle.

Monsef, A., & Mehrjardi, A. S. (2015). Determinants of life expectancy: a panel data approach. *Asian Economic and Financial Review*, *5*(11), 1251-1257.

Murwirapachena, G., & Mlambo, C. (2015). Life Expectancy in Zimbabwe: An Analysis of Five Decades. *The International Business & Economics Research Journal (Online)*, *14*(3), 417.

Navarro, V., Muntaner, C., Borrell, C., Benach, J., Quiroga, A., Rodriguez-Sanz, M., et al. (2006). Politics and health outcomes. *Lancet, 368*(9540), 1033–1037.

Navarro, V., Muntaner, C., Borrell, C., Benach, J., Quiroga, A., Rodriguez-Sanz, M., et al. (2006). Politics and health outcomes. *Lancet, 368*(9540), 1033–1037.

Nelson, C. R., & Plosser, C. R. (1982). Trends and random walks in macroeconomic time series: some evidence and implications. *Journal of monetary economics*, *10*(2), 139-162.

Oney, M. M. (2012). *An Analysis of the Relationship between Health Expenditure and Health Outcomes* (Doctoral dissertation, Youngstown State University).

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, *94*(446), 621-634.

Poikolainen, K., & Eskola, J. (1988). Health services resources and their relation to mortality from causes amenable to health care intervention: a cross-national study. *International Journal of Epidemiology*, *17*(1), 86-89.

Preston, S. H. (1976). Mortality patterns in national populations. New York: Academic Press.

Preston, S. H. (1980). Causes and consequences of mortality declines in less developed countries during the twentieth century. In *Population and economic change in developing countries* (pp. 289-360). University of Chicago Press.

Razak, F., Corsi, D. J., Slutsky, A. S., Kurpad, A., Berkman, L., Laupacis, A., & Subramanian, S. V. (2015). Prevalence of body mass index lower than 16 among women in low-and middle-income countries. *Jama*, *314*(20), 2164-2171.

Sen, A. (1983). Development: Which way now? *The Economic Journal*, *93*(372), 745-762.

Shahbaz, M., Loganathan, N., Mujahid, N., Ali, A., & Nawaz, A. (2016). Determinants of life expectancy and its prospects under the role of economic misery: A case of Pakistan. *Social Indicators Research*, *126*(3), 1299-1316.

Shan, J. (2005). Does financial development 'lead'economic growth? A vector auto-regression appraisal. *Applied Economics*, *37*(12), 1353-1367.

Shaw, J. W., Horrace, W. C., & Vogel, R. J. (2005). The determinants of life expectancy: an analysis of the OECD health data. *Southern Economic Journal*, 768-783.

Shen, C., & Williamson, J. B. (1997). Child mortality, women's status, economic dependency, and state strength: a cross-national study of less developed countries. *Social Forces*, *76*(2), 667-700.

Singariya, M. (2013). Principal Component Analysis of socioeconomic factors and their association with life expectancy in India. *Journal of Economics*, *113*, 163-72.
UNDP, (1991). *Annual report*.

Williamson, J. B., & Boehmer, U. (1997). Female life expectancy, gender stratification, health status, and level of economic development: A cross-national study of less developed countries. *Social Science & Medicine*, *45*(2), 305-317.

Wolfe, B. (1986). Health status and medical expenditures: Is there a link? *Social Science and Medicine, 22*, 993–999.

World Health Organization. (2005). WHO multi-country study on women's health and domestic violence against women: summary report of initial results on prevalence, health outcomes and women's responses.

Yavari, K., & Mehrnoosh, M. (2006). Determinants of life expectancy: A cross-country analysis. *Iranian Economic Review*, *11*(15), 131-142.