

**INFLATION IMPACT ON MEN'S LIFE EXPECTANCY AND MORTALITY RATE IN SELECTED COUNTRIES:
PANEL DATA APPROACH**

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ABSTRACT

Purpose- The main purpose of this paper is to examine the theoretical relationship between inflation and its effectiveness level of life expectancy and mortality rates for men in the middle-income group countries by using panel data. **Design/methodology/approach-** in this paper, the method of Random Effects model and Generalized Method of Moments (GMM) have been used. **Findings-** the Results of the estimation by using Fixed Effects Models and Generalized Method of Moments (GMM) in selected countries for the period 1997-2011 show that Inflation has significant negative impact on the life expectancy of men and significant positive effect on the mortality rate for men in the middle-income group of selected countries. **Originality/value-** Assessment of the factors affecting the life expectancy and mortality rate with different method for specific country is important in health economics which today, is considered that much.

KEYWORDS: Life Expectancy, Mortality Rate, Inflation, Fixed Effects, Generalized Method of Moments

INTRODUCTION

One of the unarguable proofs of social progress in recent centuries is the reduction of mortality rates and the associated increase in life expectancy. In a large number of countries today most humans are able to reach an advanced age, a privilege that was enjoyed worldwide by small minorities only one century ago (Riley, 2001). In particular, economic policies such as the level of government expenditure, tax rates, and the level of interest rates, income and education subsidies, and the level of social benefits have a crucial impact on socioeconomic factors. In addition, economic policies can influence economic growth, human capital levels and thus productivity which in turn play an important role on health inequalities. Finally, economic policies can also influence the occurrence, frequency, duration and the strength of economic cycles which in turn influence socioeconomic factors and therefore health inequalities. One of the most important of these factors is inflation (Drakopoulos, 2010). The study of general mortality is well documented in the literature. This dates back to the late seventeenth century as evident in the work of John Graunt entitled the Bills of Mortality and somewhat earlier by the Romans (Newell, 1998). Among the rationales for the study of death are its association with overall health of the population (WTO, 2009) as well as human's fascination and/or the intrigue with death, life and continued survivability (Kintner, 2004). Life expectancy calculates the number of years a person is estimated to live if he/she subscribes to the general mortality patterns, which included living with disability and/or illness (Mathers, Iburg, Salomon, Tandon, Chatterji, et al. 2004).

Partly due to these difficulties of measuring multiple dimensions of health and therefore global health, macroeconomic effects of health have been more still studied using health indicators such as life expectancy at birth, infant mortality rates, or nutritional status measures. Existing results can be questioned by addressing specifically the choice of health status indicators (Audibert, Motel and Drabo, 2012). In this direction principal objective of this paper is theoretical relationship and the level of inflation effectiveness on life expectancy and mortality rates for men in the middle-income group countries. In this article for testing the following hypothesis Static Panel Data models (SPD) and Dynamic Panel Data (DPD) has been used. Recent research seems therefore to suggest an inverse relation between the rate of improvement in health conditions and the rate of economic growth, at least in the short run and in advanced economies in recent decades (Isaacs and Schroeder, 2005).

In a logistic regression model, variables as GDP per capita and the Gini coefficient only constitute 55 percent of the distribution of infant mortality in the country. Both predictor variables were statistically significant (McLeod et al., 2003). From view point of Morris et al. (2007), health economics is application of the theories, models and empirical-

economical techniques in analysis of individual's decision-makings, producers of the health commodities and government regarding the health. Considering what was propounded, indices showing the health economics, including hygienic and therapeutic costs, life expectancy or mortality rate in a country, accessibility of hygienic facilities, population growth, index of gross rate of birth, mortality rate of children less than five years old, mortality rate of mothers due to complications of pregnancy and delivery and Total Fertility Rate (TFR) are indices of human development and index of health share from GDP. In addition to factors mentioned, the literacy level for women, the number of physician in lieu of population, the number of nurse in lieu of population and received calorie per day, pharmaceuticals expenses, variables related to employment and income in equality have been mentioned to be a part of variables affecting on the health as well. After them, Cawley J. & Simon K. I. (2011), have examined the historical relationship between macroeconomic variables and health insurance coverage. The results show that the probability of any insurance coverage is negatively correlated with the unemployment rate. Based on the results, a percentage point increase in the unemployment rate causes the health insurance coverage of men's health in men and decreased 0.54 percent to 0.62 percent decrease. This figure for children is 1.1 percent. In recent years Squires (2012), has been compared in terms of healthcare costs among 13 industrialized countries. The analyses have been shown that The United States has among the countries more than others on healthcare costs. Also, in this paper has be shown that higher costs due to higher prices and possibly technology that makes it easier to access. Quality of healthcare in the United States is not fixed and this system is more costly than the other under study countries, doesn't show Superior quality. One of the studies that are very close to the subject of this paper is the research that has been done by Bourne el at. (2014). the aim of this study was inflation impact on men's life expectancy and mortality rate in selected countries.

MATERIALS AND METHODS

In this paper has been used to evaluate the effectiveness of different variables that affect the life expectancy and mortality rate in selected middle-income countries according to theoretical basis. Based on Eq 1 and 2 are formed.

$$[1] MLE_{it} = \alpha_i + \beta_1 HC_{it} + \beta_2 INF_{it} + \beta_3 NIPC_{it} + \beta_4 FC_{it} + \epsilon_{it}$$

$$[2] MMO_{it} = \alpha_i + \beta_1 HC_{it} + \beta_2 INF_{it} + \beta_3 NIPC_{it} + \beta_4 FC_{it} + \epsilon_{it}$$

Where MLE is the Men's Life Expectancy; MMO is the Men's Mortality Rate; HC is Human Capital (enrolment, secondary (% gross)); NIPC is National Income Per Capita; FC is Physical Capital (Gross capital formation (constant 2000 US\$)); The symbols δ and ϵ , i and t show respectively error term, countries and periods. To investigate the stationary and non-stationary in variables, panel unit root test is used. Results obtained from the test of Im, Pesaran and Shin (IPS) for all used variables have used in Table 1. On the basis of results of static test, all variables are in the static level. In the following to avoid the spurious regression, Co integration test is used. Co integration test results indicate that the null hypothesis based on absence of co-integration relationship between variables in the model is rejected. So, there is long-run relationship among the variables used in the models.

For estimating Eq 1 and 2 using random and fixed effects estimator (static panel), first, it is necessary to determine the estimation methods type of panel data. Therefore, to determine the presence (absence) of separate intercept for each of the countries, the F-statistics were used. According to The amount of calculated F-statistics in Table (2), rejected the null hypothesis based on Ordinary Least Squares (OLS) method with a confidence level of 99 percent. As a result, constrained regression (ordinary least squares) is not valid and different intercepts (using fixed effects or random methods) should be considered in the models. Then for testing the model enjoying the fixed effects or random estimation method, the Hausman test was used. This testing was performed by using software EVIEWS. 6. According to The amount of χ^2 statistics obtained from the calculation for the regressions in Table (2), the null hypothesis based on use of random effects is rejected with a probability of 99 percent. Thus, fixed effects method confirmed for estimating models, which its results are presented in Table (2).

Addition to estimating models by using random and fixed effects estimator, the empirical model in this paper is estimated by using Generalized Method of Moments (GMM) relying on dynamic panel models on the 2011-1997 periods. GMM estimator, particularly in recent empirical studies of macroeconomic and financial studies has been used

widely. Using this method to estimate has many advantages. GMM estimator to estimate the unobserved individual specific delays in model (Which is done by inserting the lag of the dependent variable as an explanatory variable in the model), this estimator gives a better control of the endogenous explanatory variables of the model. The results of estimating the models by using estimator (GMM) are presented in Table 3.

RESULTS AND DISCUSSION

Results obtained from estimation of Functions in the average-income selected countries during 1997-2011 periods (Table 2 & 3) show that:

Table 1. The results of panel unit root test in selected countries during 1997-2011 period.

Regression type			
Results	P-Value	IPS Test	Variables
I_0	0.0004	-3.32732	MLE
I_0	0.0020	-2.87181	MMO
I_0	0.0000	-32.4670	INF
I_0	0.0000	-12.3523	HC
I_0	0.0000	-12.5019	FC
I_0	0.0000	-15.3576	NIPC

Source: calculated by EVEIWS.6 software.

Inflation has a significant negative effect on men's life expectancy as an indicator of health economics in selected countries; In other words, men's life expectancy is reduced by rising inflation. Therefore, the hypothesis about a significant negative correlation between inflation and men's life expectancy in selected middle-income countries cannot be rejected. Also, according the results, Inflation has positive and significant effect on the men's mortality rate as index of health economics in the group of selected countries. In other words, the men's mortality rate increases with rising inflation. So, the hypothesis about a significant positive correlation between inflation and men's mortality rate in selected middle-income countries cannot be rejected. Through various ways, inflation is effective on mortality rate of individuals. One hand, costs of the household are increased by increase of inflation which this subject leads to reduction of share of various sectors, including hygiene and treatment which this reduction means the less therapeutic cares and decrease of health. On the other hand, psychological of inflation has a destructive influence on the individuals as well a negative impact on the mortality and behaviour. The increase of mental illness such as stress is one of the psychological effects of the economic problems.

The Gross rate of enrolment in the secondary school level, as an index of human capital (HC), plays significant role as the men's life expectancy & mortality rate indices in the group of average- income selected countries. Human capital also affect in terms of train specialist manpower in the treatment of the individuals' health. Furthermore, the healthy social relationships have a positive effect on mental health. These social relationships are improved by increase of the human capital, including literacy level, in crease of human capital leads to decrease of crime and felony and law breaking which can be effective on life expectancy & mortality rate of society.

Also, according to the results can be said that National Income Per Capita (NIPC) plays significant impact on the men's life expectancy & mortality rate in group of mentioned countries. There exists a powerful relationship between national income and rate of individual's health, but nature of this relationship is not clear. Various studies show that having of higher income not only doesn't lead to higher length of life; But also, evidences show all agents dependent on the more income such as better teaching and feeding, more social relationships, family stability and ... lead to life expectancy rises and finally decrease mortality rate. In this regard, several studies show that in countries where people have higher incomes, devote more expenditure to health; thus, health of society is more. In other words, the increase in per capita income, population health spending increases. Real gross domestic fixed capital formation as an indicator of physical capital has significant positive effect on men's life expectancy and mortality rate in selected countries. High level of physical capital can be created the more Infrastructure Regarding hygiene and treatment which lead to the more establishment facilities in the field of health. Plus, higher physical capital leads to increase the level of welfare in society and life expectancy.

Table 2. Results of estimation the impact on inflation on men's life expectancy and mortality rates in the fixed effects method selected middle-income countries

Item	Dependent Variables :	
	Men's Life Expectancy (MLE)	Men's Mortality Rate (MMO)
Independent Variables	Function 1	Function 2
C	64.16242**	279.2819**
INF	-0.002096**	0.029170*
HC	0.077979**	-1.436510**
FC	3.63E-11**	-3.09E-10**
NIPC	0.000650**	-0.008756**
R-Squared	0.936094	0.961802
D.W	0.452323	0.509230
Included Observations	158	157
F(14,139)	111.320202	-
P-Value	0.0000	
F(14,138)	-	194.537419
P-Value		0.0000
Hausman Test	15.858551	14.378197
P-Value	0.0032	0.0062

Note: The interpretation of table marks: (**) illustrates a very high level of meaningfulness, {T > 2}; (*) represents high level of meaningfulness and {1.8 < T < 2}.

The quantity of determination coefficient in models shows that more than 90% of changes of the indices suggesting the health economics (men's life expectancy, men's mortality rate) in the group of the middle-income selected countries has

been described by independent variables. The Sargan's test statistic, which has χ^2 distribution with degrees of freedom equal to the number of over-identifying restrictions; rejects the null hypothesis based on correlation between the Residuals Interdependence and Instrumental variables. Based the results of this testing instrumental variables used in the estimation models are valid enough. Then, the validity of the results is confirmed for interpretation.

The results of this study suggest the following policy recommendations:

Adopting policies to increase life expectancy and improve the health of communities in ways such as: increasing the efficiency of government expenditure in the areas the health care; equitable distribution of hygienic facilities; greater use of new technologies in health systems; creation of grant access to health services for all population groups; increasing the state share costs health insurance for people; Field created equal financial participation in the financing of the health system.

Table 3. Results of estimation the impact on men's life expectancy and mortality rates by generalized method of moments in selected middle-income countries for the 1997-2011 period.

Item	Dependent Variable:	Dependent Variable:
	Men's Life Expectancy (MLE)	Men's Mortality Rate(MMO)
Coefficient	Function 3	Function 4
MLE(-1)	(0.868731)**	-
MMO(-1)	-	(0.739516)**
INF	(-0.000664)**	(0.043267)**
HC	(0.024337)**	(-0.191601)**
FC	(3.69E-12)**	(1.88E-10)**
NIPC	(0.000105)**	(-0.004507)**
J-Statisticⁱ	11.11887	10.83369

Note: The interpretation of table marks: (**) illustrates a very high level of meaningfulness, {T > 2}; (*) represents high level of meaningfulness and {1.8 < T < 2}.

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