AKKAYA science publishing

International Journal of Economics and Management Vol. 1 Issue **(3)** pp 51 - 58, 2019

The Analysis of Health Expenditure Determinates in Selected Asian Countries: Does Environmental Externalities Matter for Health Expenditure?

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Abstract
This study examines the effect of environmental externalities on health expenditure, and identifies the determinants of health expenditure in a panel of 35 Asian countries for the period of 1995-2010. The study uses Fixed-Effect Model analysis. The results suggest that carbon monoxide emissions and particulate matter concentration (PM10) have a positive relationship with per capita health expenditure. Evidence also suggests that a change in health expenditure per capita in Asian countries is mainly explained by the change in population aged more than 65 years and above and country's income affect the health expenditure allocation. The finding of this paper have important implication on the Asian countries policymakers in archiving the sustainability of national development especially on health related expenditure.
Keywords: Environmental externalities, Health expenditure, Population aged more than 65 years and Above, Country income, Panel data analysis.
JEL classification: Q530, F12, I310, E1, C1

1.Introduction

Environmental risk factor is known to contribute significantly to health problems and found to drive rising health expenditure. According to the World Health Organization (WHO, 2008), every year air pollution from burning fuel wood, crop residues, or animal dung affected people's health and caused millions of deaths. Rapid economic growth, human activities and population growths are known to create pressure on the environment which includes depletion of resources, pollution, global warming, and increase demand for energy production. Generally, environmental threats are societal costs that are not reflected in market transactions (Jonathan and Florentin, 1997). For example, the manufacture of a consumer, such as cars or motorcycles may generate pollution from the production process or within consumer usages. The costs of this pollution especially health are typically not paid for by the producer or consumers, but are borne by other members of society (Paresh and Seema, 2007). Therefore, these pollution costs or damages from production are usually not paid in full by the companies, thus generating what is known as "environmental externalities".

Meanwhile, the behaviour of health expenditure is still a great concern as the amounts that spend on health across countries are varies. According to OECD (2011), there are large variations in how much OECD countries spend on health, and the health spending shares of Gross Domestic Product (GDP). Moreover, WHO (2009) points out that the government health expenditures in Europe (76 per cent) differ significantly with South-East Asia (34 per cent). Empirically, studies shown that health expenditure has several determinants. At first, Guillem and Marc (2006) believed that the allocation of health expenditure influence by the income elasticity. This argument is re-examined by Xu Kea *et al*. (2011) but their study suggests that generally health expenditure does not grow faster than gross domestic product where it shows that income elasticity is in between 0.75 and 0.95. Secondly, Marc *et al*., (2010) proposed that life expectancy also determine health and hospital costs. Several studies (see Hansen and King, 1996; Metteo, 2005; Chor, 2010) imply that aging population significantly influence the long run health expenditure. Third, aside from that total reported exports and imports of health-related travel in OECD countries each amounted to more than USD 6 billion in 2009 and still increasing, which indicate that openness to trade will induce more expenditures on public health as proposed by David and Dov (2005). Fourth, M. Harvey (2012) claims that reduced labour force participation has a negative effect reflecting the loss of health spending and health insurance and this implies that, labour force has positive coefficients with public health care spending (Oni and Babatunde, 2014). Nevertheless, as discuss earlier, in line with economic growth in most countries, the consumption of crude oil, gasoline, kerosene, diesel, and fuel oil increase and lead to pollution damages in the

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form of negative environmental externalities. Paresh and Seema (2007) imply that environmental condition should be included into considerations for determining the health expenditure as the relationship between environmental condition and health expenditure remains ambiguous and limited.
OECD (2012) stated that health spending in many Asia countries grows faster than economic growth over the past ten years, which means that the share of health care expenditure in total expenditure continues to increase. Moreover, According to World Development Indicator (2014), Asia has some of the most polluted air in the world, as measured by the concentration of fine suspended particulates of less than 10 microns in diameter (PM10), that's capable of penetrating deep into the respiratory tract and causing severe health damage.
Thus, this study aims to examine the association between health expenditure and environment externalities, as well as other factors that determine health expenditures in selected Asia countries. There are two pertinent questions in this context. First, do environmental externalities influence the health expenditure? Second, what is the major determinant for health expenditure?
This paper is organised as follows: Section 1 discusses the background of the study. Section 2 gives special attention to studies on health care expenditure and environmental externalities. Section 3 discusses the research methodology. The empirical results and concluding remarks discuss in Section 4, and Section 5 accordingly.

2.Literature Review
This chapter discusses previous literature that describes the environment in economic perspectives, the relationship between environmental externalities and health expenditure, and others health expenditure determinant.
To date, few studies that look at the association between environmental quality and health expenditure. Earlier study conducted by M. Jerrett *et al*., (2002) aim to find out the association between health expenditures and environmental variables in 49 counties of Ontario, Canada. In this cross countries study, the environmental quality proxies by two variables; first, is total pollution emissions that emitting over 10 tonnes every year. Their findings show that, by assuming other variables that may influence health expenditures is unchanged, both variables have significant positive effect on health expenditures. Thus they conclude that as countries allocated more in protecting environment, they tend to have lower expenditures on healthcare. The prominent study conducted by Kumar and Seema (2007) adopted a panel co-integration method to examines the environmental quality role in determining per capita health expenditures in the short-run and long-run. In their study, they measure environmental quality using as proxies such as the emissions of nitrogen oxide (kilos per capita), sulphur oxide emissions (kilos per capita) and carbon monoxide (kilos per capita). Their findings show that environmental pollution proxy by sulphur oxide emission has a statistically significant positive impact toward health expenditures. Narayan and Narayan (2008) who study the association between health expenditures and environmental quality proxies by carbon monoxide emissions, sulphur oxide emissions and nitrogen oxide emissions in eight OECD countries for the period 1980-1999. This positive association between health expenditure and CO_2 also confirmed by recent study by Assadzadeh *et al*., (2014) and) for OPEC countries for the period 2000-2010.
Previous studies have shown that health expenditure has many determinants. First, income and economic growth have been identified as a main factor to demonstrate the differences across countries in the level and growth of total health care expenditures. Chor (2010) and Murthy and Ukpolo (1995) both show that health expenditure and income, along with other determinants, are cointegrated. Chor (2010) adopts the Johansen-Juselius co-integration test to identify the relationship between health expenditure and economics determinant. This study employed the variable government income, the price of health care and aging population as the determinants of health to investigate the determinants of health expenditure in Malaysia within the time series period from 1967 to 2007. On the other hand, Murthy and Ukpolo (1995) assess the association between health expenditures and income, along with other variables, including health services and Medicare prices, the number of practicing physicians, public healthcare expenditure in the United States of America over the period 1960-1987. Second, Lien *et al.* (2009) claims that one of the most important key variables that determines expenditure on health is the proportion of the elderly population. In their study on relationship between population aging and healthcare costs in Asia, Ogawa *et al*., (2009) estimated Asia's health expenditure by age profile for four countries, namely; Thailand, Korea, Philippines, and Indonesia. Results show that the amount of spending on health slightly increases after the age of 40; moreover individuals at the age of 75 spend 3.4 times on health compare to average individuals at 25. In contrast, Steven and Collen (2011) found out that aging population only contributes less than 1% per year to healthcare expenditure, and therefore their forecast of the future effect of aging population to healthcare spending continues to be small. Third, the trade activities may also impact health expenditure. Latter study on the impact of trade on growth by Frankel and Romer (1999) fear that trade openness can lead increases in pollution level which reduces government resources for investments in health as more allocation for protecting the environment. In contrast, David and Dov (2005) adopted Frankel and Romer's gravity model claim that trade openness will generate more income and increase the expenditure on public health.
Finally, Oni and Babatunde (2014) show in the empirical relationship to public healthcare spending, labour force has a positive coefficient. Meanwhile, M. Harvey (2012) finds that reduction labour force participation has a

negative effect on cardiovascular health in the United States, likely reflecting the loss of health spending and health insurance.

3.Methods and Data

This study attempt to fill the research gap for health expenditure determinants literature by considering the impact of environmental externalities which are represented by greenhouse gases in the forms of carbon dioxide emissions (CO2) and Particulate Matter country level micrograms per cubic meter (PM 10) on health expenditures in selected Asian countries. Schlesinger *et al*., (2006) argued that carbon dioxide and particulate matters (PM) are the main cause for several main health problems such as cardiovascular and respiratory diseases. This study also include other determinants including health expenditure, the country's income (GDP, constant 2005 US$), the population aged 65 and above as a vulnerability variable, trade openness, and labour force. Data are sourced from the World Bank's World Development Indicator 2014 (World Bank, 2014). The study sample consists of 35 Asia countries, namely, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, India, Indonesia, Iran, Japan, Jordan, Kazakhstan, Israel, Korea, Rep, Kuwait, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Turkmenistan, UAE, Uzbekistan, Vietnam and Yemen. This study covers the period from 1995 to 2010.

It is contemplate that the per capita real health care expenditure of the selected 35 Asian countries is influenced by environmental externalities proxy which are CO2 and PM10 and the three main determinants, namely; the country's income, ageing population proxy by population aged 65 and above, labour force and trade.

A panel data analysis model is employed to estimate the environmental externalities and health expenditure. First, data is pooled and estimated using Ordinary Least Square (OLS) regression analysis. Pooled analysis incorporates time series for several cross-sections. According to Tas, N. (2013), if there is no country specific effect in the model, then the model become the pooled ordinary least squares regression. The pooled linear regression model based on the ordinary least squares (OLS) procedure as in the equation below:

$$y_{it} = \beta_i + \sum_{k=0}^{n} \beta_k \, x_{kit} + e_{it} \qquad (1)$$

where i = 1,2,….n represent a cross-sectional unit, and k = 1,2,….k indicate the specific explanatory variable and t = 1,2,….; t refers to a time period,. Thus, $\boldsymbol{y_{it}}$ and x_{kit} refer to dependent and independent variables for unit i and time t respectively; β_i is the intercept, β_k represent the elasticity of parameter and $e_{it}=\alpha_i + \varepsilon_{it}$, is represent the unobserved country-specific time-invariant effects ($\boldsymbol{\alpha_i}$), and the residual disturbance term which has zero mean, constant variance, and is uncorrelated across time and individuals($\boldsymbol{\varepsilon_{it}}$) is.

According to Plumper *et al*., (2005) if $\boldsymbol{\alpha_i}$ is correlated with both $\boldsymbol{y_{it}}$ and $\boldsymbol{X_{it}}$ the exclusion of the term $\boldsymbol{\alpha_i}$ will lead to bias the estimation of pooled OLS. In order to address this problem, fixed effect or random effect models should be used. In Fixed-Effect model it assumes that $\boldsymbol{\alpha_i}$ are fixed or as country-specific constant term, thus $\boldsymbol{\alpha_i}$ is correlated with the independent variable (Baltagi, 2008). In this case, Within Group (WG) estimators, so-called "fixed effects estimators" are used to estimate the parameters. The fixed-effects estimator subtracts from the equation to be estimated the overtime average of the equation for each country and $\boldsymbol{\alpha_i}$ remove from the estimation. This method automatically avoids any potential correlation between $\boldsymbol{\alpha_i}$ and explanatory variables. The random-effects (RE) model differs from the fixed-effects (FE) model in that the differences between individuals are assumed to be random and uncorrelated rather than fixed. Random effect model assumes that the unobserved country-specific $\boldsymbol{\alpha_i}$ are random variables and uncorrelated with ε_{it} therefore, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model.

To decide between fixed or random affects models Hausman test (Hausman, 1978) is best to employ, where the null hypothesis is that the preferred model is a random effects versus the alternative hypothesis that the fixed effects is preferred. This test compares the fixed effect model and random effect model based on the assumption that individual and time-effects (μ_{it}) are not correlated with the independent variable (X_{it}) (Hausman, 1978).

4.Health Expenditure Model

In his early works, Newhouse (1977) introduces the health expenditure model which treats health expenditure as dependent variable and income variable as independent variable. His model is the root for several studies and has been extended by several researchers in a bivariate model.

The current study examines the environmental externalities effects on health expenditures and determinant of health expenditure in Asia. In achieving this objective, expand the Newhouse model to a multivariate model and adopt two different measures for environmental quality and other determinants as in equation 4.

$$HE = \beta_0 + \beta_1 \, CO2_{it} + \beta_2 \, PM10_{it} + \beta_3 \, GDP_{it} + \beta_4 \, POP65_{it} + \beta_5 LF_{it} + \beta_6 TRADE_{it} + \varepsilon_t \qquad (4)$$

Where, HE denotes health expenditure per capita at Purchase Power Parity(PPP) (constant 2005 international $), CO2 is carbon monoxide emissions (kilos per capita)and PM10 is particulate as a proxies of environmental externalities, GDP is the country's income (GDP, constant 2005 US$); POP65 is population aged 65 and above, LF denotes supplies of labor for the production of goods and services during a specified period , and TRADE is the total of exports and imports of goods and services measured as a share of gross domestic product. The term ε_t is the error term while variables incorporating a subscript i, representing country in year t for panel data estimation.

Table 1 defines the independent variables used to determine health expenditures and the expected sign of the coefficient for each variable.

Table 1: Definition of Independent Variables Included in Equation (4)

Independent Variables	Definition	Expected sign of coefficients
CO2	Carbon monoxide emissions (kilos per capita),	Positive
PM10	particulate matter concentrations refer to fine suspended particulates less than 10 microns in diameter	Positive
GDP	Country's income (GDP, constant 2005 US$)	Positive
POP65	All residents regardless of legal status or citizenship aged 65 and above except for refugees not permanently settled in the country of asylum.	Positive
LF	Total labor supplies for the production of goods and services during a specified period.	Positive
TRADE	Sum of exports and imports of goods and services.	Positive

5.Empirical Results

The results of the regression analyses of the pooled OLS model as presented in Table 2. Results indicate that CO2 emissions, PM10, GDP and POP65 show a significantly positive effect on health expenditure. On the other hand, labour force (LF) has a significantly negative effect on health expenditure, at the statistically significant level of 5 per cent significance. In POLS regression variable, Trade, is shown to be not statistically significant.

Table 2: Estimation Result in Pooled OLS Model Results

Independent Variable	POOLED OLS
Carbon Monoxide Emissions (CO2)	2.3580*** (1.0770)
Particulate Matter (PM10)	0.6719** (0.3655)
Country's income (GDP)	0.0310*** (0.0020)
Labour Force (LF)	-0.1286*** (0.0106)
Aging Populations (POP65)	8.7340*** (7.0324)
TRADE	-0.3550 (0.2161)
Constant	30.230 (57.933)
Numb. Of countries	35
Observation	540
R-squared	0.793
Adjusted R-squared	0.790

F-statistic	340.36***

Notes: Dependent variable is the health expenditure. Robust standard errors are heteroscedasticity consists reported in parentheses. All variables are expressed in natural logarithm (ln). (*) significant at the 10 per cent level, (**) significant at the 5 per cent level, and (***) significant at the 1 per cent level.

Before accepting the pooled OLS model, the null hypothesis that constant terms are equal across countries is tested to determine if the pooled OLS regression produces inconsistent estimates. The Pooling test examines whether the intercepts take on a common value of β. This test is also known as the test for heterogeneity. The hypothesis is tested with an F-test. Based on the result, the p-value is 0.0000 which rejects the null hypothesis, and thus provides strong evidence for the case of retaining country specific effects in the model specification. Therefore, the result indicates that the pooled ordinary least squares model is inconsistent, and a fixed-effects model or a random-effects model should be used. To decide between fixed or random effects models, a Hausman test was performed. The following results are observed, as reported in Table 3.

Table 3: Summary of Hausman Test

Sample	Chi-Sq. Statistic	Chi-Square Degree of freedom	Probability
1995-2010	69.656119	6	0.000***

Note: ***Significance level at 1 percent.

Result in Table 3 shows the null hypothesis that null hypothesis is rejected as the p-value for the test of significance is at less than 5%, therefore the random-effects model is not appropriate. This implies that the unobserved effects and the other repressors are correlated; therefore the random-effects model would lead to inconsistent results (Hill *et al.*, 2008). Therefore, we should use a fixed-effects estimator.

The table from Table 4 displays the result of a panel data fixed-effects model. In this model, the $\boldsymbol{R^2}$ value is 0.957. This means that 95.7 per cent of the variation in per capita health expenditure can be explained by the variation in CO2 emissions (CO2), particulate matter concentrations (PM10), Population ages 65 and above (POP65), Country's Income (GDP) labour force participant (LF) and Trade (Trade). Based on the results, environmental externalities determinants shows a positive effect with per capita health expenditure, with statistically significant coefficients at the 5 per cent significance level. On the other hand, GDP and POP65 shows statistically significant positive effect health expenditure. Meanwhile the variable LF was found to be statistically significant negative effect on health expenditure and TRADE not statistically significant. In order to correct for heteroscedasticity, a fixed-effects regression was run using robust standard errors.

Table 4: Estimation Result in Fixed-Effect Model Results

Independent Variable	FE ROBUST
Carbon Monoxide Emissions (CO2)	4.746** (4.093)
Particulate Matter (PM10)	4.270** (0.676)
Country's income (GDP)	0.002** (0.002)
Labour Force (LF)	-0.512*** (0.090)
Aging Populations (POP65)	10.000*** (2.628)
TRADE	0.274** (0.153)
Constant	0.002*** 270.759
Numb. Of countries	35
Observation	540
R-squared	0.956
Adjusted R-squared	0.953
F-statistic	276.86***

Note: Dependent variable is the health expenditure. Robust standard errors are hetereskedasticity consists reported in parentheses. All variables are expressed in natural logarithm (ln). (*) significant at the 10 per cent level, (**) significant at the 5 per cent level, and (***) significant at the 1 per cent level.

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International Journal of Economics and Management Vol. 1 Issue (3) pp 51 - 58, 2019

Comparing the results of the present research with the literature, we can note that results concerning the environmental externalities and health expenditure are accordance with Kumar and Seema (2007) and Narayan and Narayan (2008) and Assadzadeh *et al*., (2014), thus confirmed that as Asian countries emitting more pollutions, they tend to have increase the expenditures on healthcare. Result concerning the positive effect of income level is in accordance with most of the previous studies (Chor, 2010). Our result also in line with Ogawa *et al*., (2009) and Lien *et al.* (2009) which implying that as ageing population grow, the demand for health expenditure also increases. The negative sign of the relation between labour forces is in accordance with the findings of M. Harvey (2012) which implies that an increase in labour force participation will increase the allocation for health expenditure. Finally, this result confirmed that trade openness increases the health expenditure in Asian countries.

6.Conclusion

This paper employed static panel data analysis to examine the environmental externalities effect on per capita health expenditure for selected Asian countries over the period of 1995-2010.We differentiate our paper from the extant literature by examining the impacts of environment externalities, with the inclusion of the income, ageing population, labour force, and trade openness as other determinants for health expenditure for Asian countries.

Based on our result, the presence of unobserved heterogeneity implies that the Pooled OLS estimator is biased; therefore the findings were based on the results of panel data fixed effects analysis with robust standard errors. Summarising, both of environmental externalities determinant shows similar direction where the intensification of CO2 emissions and PM10 concentration is likely to increase the allocation of health expenditure. According to Ghorashi, N., & Rad, A. A. (2017), the environmental externalities in line with the economic growth which increase the ability to spend more on health. Nevertheless, in the long term, it will lead to a great pressures exerted on government budget (Abdullah *et al*., 2016). In addition, among the five explanatory variables, a larger proportion of the variation in per capita health expenditure in Asian countries is explained by the proportion of the population aged more than 65 and above. Further, our findings also imply that when countries become wealthier, the health expenditure allocation will increase, such as improvement in health services. Moreover, the findings indicate that Asian countries with high numbers of labour force participation tend to have lower per capita health expenditure. Finally, trade openness also contributes to the heath expenditure, where countries with higher trade activities tend to have higher health expenditures per capita.

This might heighten the risk of pollution-induced health diseases, as environmental externalities such as air pollution significant negative impacts on human health and potential health expenditure will increase. As Asia is the highest population encompassing almost 60 per cent of the world's current population (ADB, 2011) and still growing rapidly, this issue will become that much more important from a policy point of view. Therefore, our results suggest that health policy should include environmental externalities issues; failure to do so is likely to see an increase in health expenditures. While it is useful to know what drives health expenditure increases, it is important for policymakers to know whether increased spending on health facilitates achieving universal coverage, and generally improves people's health. On the other hand, governments should be aware of the other determinants, such as an increase of numbers of the labour force (LF) will reduce the allocation of health expenditure. This might occur because of the fund for labour force increase which in turn reduces funds available for health expenditures. Finally, the levels of environmental regulations and demand for environmental are different among Asian countries which directly or indirectly depend on the level of income (Yassin, J., & Aralas, S., 2019), thus, Asian countries should incorporate the environmental and economic policies to stimulate the economic growth and at the same time encourage the reduction of environmental externalities.

References

1.Benarroch & Pandey (2012). The relationship between trade openness and government size: Does disaggregating government expenditure matter? *Journal of Macroeconomics*, 34, 239–252. doi:10.1016/j.jmacro.2011.11.002

2.Bai, X., &Imura, H. 2015. *A Comparative Study of Urban Environment in East Asia : Stage Model of Urban*, *1*(1), 135–158.

3.Baltagi, B. H., &Moscone, F. 2010. *Health care expenditure and income in the OECD reconsidered: Evidence from panel data. Economic Modelling*, *27*(4), 804–811.

4.Cheng Hsiao, 2004, *Analysis of Panel Data, 2nd Edition by, "International Journal of Forecasting 20:1 (2004*), 142-3.doi:10.1016/j.ijforecast.2003.11.004

5.Farsiabi, M. M. (2013). *Environmental Externalities and Health Expenditures : A Cross-Country Analysis of Health Expenditure Determinates*, 1–18.

6.Forest, N (2010).*Environmental status and challenges in and around the fergana valley, central asia Gannon, S. Public Health in South Asia Public Health in South Asia*, (July).

7.Frankel, J.A., Rose, A.K., 2005. Is trade good or bad for the environment? Sorting out the causality.*The Review of Economics and Statistics* 87, 85–91.

8.Hansen, A.C., Selte, H.K., 2000. Air pollution and sick-leaves: a casestudy using air pollution data from Oslo. *Environmental and Resource Economics* 16, 31–*50*.

9.Hansen, P., King, A., 1996. The determinants of health care expenditure: a cointegration approach. *Journal of Health Economics* 15, 127–137.

10.Hausmann, J.A., Ostro, B., Wise, D.A., 1984. Air Pollution and LostWork. *Working Paper, vol. 1263. National Bureau of Economic Research (NB*ER), Cambridge

11.Hill, R. C., Griffiths, W. E., Lim, G. 2008. *Principles of econometrics*. John Wiley & Sons Inc

12.Howes, S.2012. *Asian Development Bank Institute*.

13.Issa, H., &Ouattara, B. (2005).*The Effect of Private and Public Health Expenditure on Infant Mortality Rates : does the level of development matters ?* Introduction :,*44*(0).

14.Jeffrey Morris, 2013, *Globalisation, Economic Transition and The Environment.* Flinders University, Australia

15.Lobell, D. B., Burke, M. B., Tebaldi, C., Mastrandrea, M. D., Falcon, W. P. and R. L. Naylor, 2008. *Prioritizing Climate Change Adaption Needs for Food Security in 2030.*

16.Yassin, J., & Aralas, S. (2019). Economic Structural Transformation and Co2 Emissions in Asian Countries: Homogeneous Vs. Heterogeneous Estimators. *Journal of Tourism, Hospitality and Environment Management, 4(13), 57-68.*

17.Jerrett, M., Eyles, J., Dufournaud, C., & Birch, S. (2003). *Environmental influences on healthcare expenditures: an exploratory analysis from Ontario, Canada.Journal of Epidemiology and Community Health*, *57*(5), 334–8.Retrieved from. http://www.pubmedcentral.nih.gov/ articlerender

18.Jonathan Koomey and Florentin Krause,(1997), *Introduction to Environmental externalities Cos*t, CRC Handbook on energy efficiency.

19.Narayan, P. K., & Narayan, S. 2008. *Does environmental quality influence health expenditures? Empirical evidence from a panel of selected OECD countries.Ecological Economics*, *65*(2), 367–374. doi:10.1016/j.ecolecon.2007.07.005

20.Narayan, P.K., 2006. *Examining structural breaks and growth rates in international health expenditures*. Journal of Health Econimics 25, 877–890.

21.Pedroni, P., 1999. Critical values for cointegration tests in heterogenous panels with multiple regressors.*Oxford Bulletin of Economics and Statistics* 653–670 Special Issue.

22.Newhouse, J.P., 1977. Medical care expenditure: a cross-national survey. *Journal of Human Resources 12, 115.*

23.OECD (Organisation for Economic Co-operation and Development).2011.*Towards Green Growth*.available at http://www.oecd.org/dataoecd/37/34/48224539.pdf

24.Ramesh, R., Kumar, K., S. Eswaramorrthi and G. Purvaja 1995.*Migration and contamination of major and trace elements in ground water of Madras City*, India. Environmental Geology 25: 126 –36

25.Pearce, D., Turner, K.R., 1991. *Economics of Natural Resources and the Environment.* John Hopkins Press, Baltimore.

26.Tas, N. 2013. *Analyzing Macroeconomic Indicators of Economic Growth Using Panel Data*, 10–11.

27.World Bank. 2014. *World development indicators 2014* [Data file]. Retrieved from http://data.worldbank.org/data-catalog/world-development-indicators on 27 September , 2014.

28.World Health Organization 2008.R*egional Overview of Social Health Insurance in South-East Asia. New Delhi: WHO, Regional Office for South-East Asia.*

29. Imanova Bahar (2019).Assessment of modern activity of healthcare institutions for management of human resources. Journal of Science and Innovative Technologies. DOI: 10.5782/2616-4418.8.2019.26.Number 8.Baku,Azerbaijan.pp.26-39

30.World health statistics. 2008. Geneva, World Health Organization, 2008 (http://www.who.int/whosis/whostat/2008/en/index.htm, accessed 3 August 2014)
31.Ghorashi, N., & Rad, A. A. (2017). CO2 Emissions, Health Expenditures and Economic Growth in Iran: Application of Dynamic Simultaneous Equation Models. *Journal of Community Health Research*, *6*(2), 109-116.
32.Abdullah, H., Azam, M., & Zakariya, S. K. (2016). The impact of environmental quality on public health expenditure in Malaysia. In Second Asia Pacific Conference on Advanced Research (pp. 27-40).