ISSN No:-2456-2165

A Comparative Analysis of Sustainable Growth on Health: Evidence from Asian Countries

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Abstract:- The economy of Asian is suffering from many economic problems and in this regard Fertility rate is also one. So, it is an attempt to capture the actual determinants of fertility rate by taking Gross national income, Health expenditure, Education expenditure, Environment performance index, Trade openness and Governance as an independent variable. These independent variables are significantly at the back of this problem and this study proposed how the Asian countries can control the fertility rate to maintain the high living standard and how to attain the sustainable growth in health sector. We can say that it is an attempt to see how these independent variables are determining the fertility rate in the Asian economy.

Keywords:- *Fertility Rate, Gross National Income, Health Expenditure, Education Expenditure, Environment Performance Index, Trade and Governance.*

JEL Code—I10, I20, I28, F10, Q50

I. INTRODUCTION

It is true that toddler death rates are regrettable across the world and particularly in economics. It is naturally look that health issues of human development in a country also damage children indeed, high rate affects due to lack of proper child care, lack of education and social preference etc.

Infant mortality rate may be damaged proper population rate in future because in coming years, there will be lack of intelligent students, the reasons same as we have discuss above paragraph. In addition to it, According to the report which have published in 1993, they proved that poor health certainty damage economy and society, because healthy body mean healthy mind. When a large number of children suffer with poor health, it will destroy in future.

In this paper we have collected data from 117 countries, the objects is same, because it is really a big issue across the world, and both developed and developing countries are affected by it. Moreover, female labor force and literacy rates are also remarkable. In the last year the attention of economists has shifted from tangible input to intangible as key determinants in economic behavior among intangible assets, a critical role is played by knowledge assets, in this sense intangible become important to wealth creation in cities, hence cities must find mechanism to facilitate the development of knowledge within sustainability objectives.

The labour quality, in the form of human capital, obviously contributes to economic growth various countries are identified narrowly as human capital with education. This practice ignores well-fortified reason for considering health to be a crucial aspect of human capital, and that's way a critical component of economic growth. Healthier workers are physically and intellectually more energetic and robust.

They are more lucrative and earn higher wages. They are also less likely to be absent from work because of illness, the aims of this paper is just to signify, weather this micro evidence can be corroborated by macro evidence of an affect at population health on economic growth. Considerable micro economic evidence return to 1974, indicates that experience has an impact on workers earning by adjustment the experience of the workers directly into the model we control for this effect , our model priority are direct to the effect of education and health on output, we do not investigate how to education and health are themselves created. This apply however, we may miss the effect of increased education on health. According to the data of millennium development goals indicator mortality rates per 1000 live births was estimated to have reached in 2007 the estimated rates was per 1000 live births in developed regions and 51 per 1000 live births in developing countries.

Neonatal mortality is death occurring in the first month of life and is typically associated with events surrounding the neonate period and the infant's delivery. The highest risk for infant death is in the neonate's period because of per- term birth, the effects of the socioeconomic variable are indirect because they operate through the biomedical factors. Biomedical factors are called intermediate variables because they constitute the middle step between the socio economic variables and child mortality. The effects on infant have seen at household level in Egypt while in corpora ting with socioeconomics and demographic variables.

ISSN No:-2456-2165

II. OBJECTIVE

- To highlight the main Determinants of Fertility rate in Asian Countries.
- To present the suitable policy to overcome fertility rate
- The objective of this research that these determinants achieve the sustainable growth on health or not.
- This is the way of new research to allow the some features of the model to be improved.

III. HYPOTHESIS AND ORGANIZATION OF STUDY

In this research analysis Feasible Generalized Least Squares model is used, we can say that it is an attempt to check the cross sectional heteroskedasticity and cross sectional autocorrelation, and time series autocorrelation for this purpose the null hypothesis would be there is no hetero and autocorrelation among the variables and the alternative hypothesis would be there is heteroskedasticity and autocorrecting among the variables.

After the comprehensive introduction determinants of health with there is also need to know the complete organization of this study. So, after introduction there is a literature review which is presenting how previous researcher tried to find out the determinants of fertility rate. After that there is data and methodology section where there is complete information of the variables along with data source functional form estimations and then interpretation of the estimations. In the end there is conclusion and policy implementation.

IV. LITERATURE REVIEW

Hassan et al (2016) also attempt to capture those determinants which are affecting the fertility rate in the case of Asian countries by applying the Feasible Generalized Least Squares model (FGLS) to remove the heteroskedasticity and auto correlation from cross section and time series dataset and the years take from 2008 to 2016. For this purpose they have selected gross national income, health and education expenditure in case of Asian countries. So, in this research we can easily examine the significant effects of independent variable that is fertility rate.

Haider et al (2015) tried to find out the main determinants of fertility rate in Pakistan with the help of quarterly data in the period 1991Q1-2007Q4. In this study health expenditure is representing growth of health and the independent variables are governance, Gross national income, trade is also keys of sustainable growth on health. According to this study these independent variables are affecting the infant mortality rate in Pakistan more intensely.

Crox and Gobi (2016) examined the relationship between fertility and population density, on the theory of Malthus population, and described that agriculture income was low in areas of high population density, and people living in that area often They used to delay marriage and they discussed that this fertility, and population negative relationship between density has been brought. Modern visual income is more in those areas which exit from the group economy, and in low-income areas the birth rate is low so that there is a negative relationship between reproduction and income. Apart from this, he discussed that those who had a relatively poor priority would reside in urban areas in contrast, for those who had a relatively strong priority, they will live in rural areas, so this trend brought negative relations between fertility and population density. That is, they concluded that population density was not only a determinant of fertility, but it would affect the place where people lived.

Zerai (1996) represented his point of view in 1996, about socio-economic and demographic variables in a multi-level frame work to justify its situation, which influence on children survival in Zimbabwe. He employed coax regression analysis to the 1998 Zimbabwe DHS data to study socioeconomic determinants of infant mortality. The results was that women's average education levels in their community, utilize a greater influence on infant survival is strongly affected by mass education. However, the author did not show the different impact of the independent variables on infant and child mortality.

Manda in (1999) used data from DHS in Malawi to study the relationship between infant and child mortality and birth interval, maternal age at birth and birth order, with or without controlling for other relevant explanatory variables.

Moreover, Lutz and Qiang in (2002) elucidates collected a systematic and theoretic examination about the relation between fertility rates and population density from the view of demography. However, there was ideas research which used country level data and showed a negative relationship between them. Furthermore, they introduced the research using U.S states data from 1800 to 1860.

In addition, they discussed that the people who had a relatively weak performance for children would inhabit urban areas, in opposite to it, people who had a relatively strong performance for children would inhabit rural areas, anyhow, this tendency brought the negative relation between fertility rate and population density.

Yaqub et al argued in 2012 about health that the reduction in corruption may change in health outcomes, it is search by several other people and concluded as a different shapes, i.e. some studies found a strong effect while some found weak effect. No any studies could examine the effect of public and private health spending on health outcomes in comparing meaner, or etiquette.

Turkey (1989) given an evolutionary theory, about social and economic success, and present three variables which can change human fertility, like that supply of children, demand children and, cost of fertility regulation.

Hirschman (1994) summarized that there are two major economic approaches which can change in fertility, "new home economic'' and second is "synthesis of economic and sociological theories.

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V. THEORETICAL FRAMEWORK

The complete wellness care complex is available by the both public and private sector in different countries along the different probability of share. The public health care spending is a major concern in low and middle-income countries as people with low income are more likely to choose public health care services because mostly people have no pocket money. The negative relationship between Fertility rate and gross national income because if fertility rate increase meaning that population increase then gross national income definitely decrease in this perspective we can called that these two variables have negative relationship. Similarly fertility rate and education expenditure have negative relationship we well known that if population increase then government less spending on education sector in this way these have negative relation. Similarly all variable have negative relationship between fertility rates.

VI. RESEARCH GAB

According to the above presented literature review it is quite clear that no one has used environment performance index, education expenditure, health expenditure, trade openness and governance in the case of Asian countries for panel data model form the time period 2008 to 2016. So the sample size and the combination of independent variables make this research work unique from the others. Not only this, the results are also significant and according to the theory.

VII. DATA AND METHODOLOGY

We well-known that Fertility rate, education expenditure, health expenditure is a economic problem and so many developing countries are suffering due to this problem Pakistan is also one of them in this research paper effect of sustainable growth based on 6th independent variables. Effect of sustainable growth on health in this study is fertility rate, gross national income, health expenditure, education expenditure, trade and governance.

Similarly health expenditures and education expenditure are also related with the fertility rate, because if fertility rate high then this leads to increase in both expenditures and similarly due to this reason economy will move up and down. Environment performance index is representing environment condition because this variable tells us that if fertility rate up or down then economy how much change. Trade openness representing the total amount of exports of goods and services and imports of goods and service, similarly the variable of governance is representing that how government policies control the insignificant effect of these variables. For this purpose the representation of the variable is in the following form:

FR we well-known that is the Fertility rate
GNI it is called Gross National Income
E EXP it is known as Education expenditure
H EXP it is known the Health expenditure
E PE it is known the Environment performance index
Trade it is known as Trade Openness
Govt it is known as Governance

VIII. DATA SOURCE

It is a research analysis based upon the secondary type of data collected from World Development Indicators (WDI) and Environment performance index. The functional form of the above stated variables would be as follows.

IX. MODEL

Below is the functional form which is being used in this research paper.

$$FR = f(GNI, H\ EXP, E\ EXP, EPI, TRADE, GOVT)$$

To estimate the coefficients the well-known multiple regression line in general form would be:

$$Y = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \beta 6\ X6 + \varepsilon$$

In the above model ε is an error term therefore, together with these variables the regression line would be look like as follows:

$$FR = \beta 0 + \beta 1\ GNI + \beta 2\ H\ EXP + \beta 3\ E\ EXP + \beta 4\ EPI + \beta 5\ TRADE + \beta 6\ GOVT + \varepsilon$$

In the above model $\boldsymbol{\beta}0$ is the intercept term and it tells when all independent variables are equal to zero and hen the value of dependent variable is equal to intercept. Moreover $\boldsymbol{\beta}1$ is the coefficient of GNI, $\boldsymbol{\beta}2$ is the coefficient of H EXP, $\beta 3$ is the coefficient of E EXP, $\boldsymbol{\beta}4$ is the coefficient of EPI, $\boldsymbol{\beta}5$ is the coefficient of TRADE and, $\beta 6$ is the coefficient of GOVT.

X. VARIABLES EXPLANATION

Table 1 Variables Explanation

NO	Variable Name	Symbol	Data Explanation
1	Fertility Rate	FR	Total fertility rate as per woman
2	Gross National Income	GNI	Gross National income (constant LCU)
3	Health Expenditure	H EXP	Domestic general government health expenditure (% of GDP)
4	Education Expenditure	E EXP	Government expenditure on education, total (% of GDP)
5	Environment performance index	EPI	Environment performance index
6	Trade openness	Trade	Trade (% of GDP)
7	Governance	Govt	Average of 6th indicators

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XI. METHODOLOGY

These coefficients are estimated with the help of Feasible Generalized Least Squares model (FGLS), it is called so because we used to remove the Heteroskedasticity and Autocorrelation. But before we move towards the estimations let we have the proper reference of all the variables which are being used in this model.

The first variable is taken with the reference of modeling the fertility impact of the proximate determinants: Time for a tune-up by Johan Bongaarts in (2015).

Evidence on the relationship between education, skill and economic growth in-income countries regard by Denise Hawkes in (2012).

Environment performance index taken from The Analysis on Disparities of Fertility Rate of Japanese Municipalities by Hisakazu Kato in (2018).

Gross National Income is taken from On the Impact of Income per Capita on Health

Outcomes: Is Africa Different by Elizabeth Asiedu in (2015).

Health Expenditure variable is taken from this article The Effects of Public and Private Health Care Spending on Child Mortality in Developing Countries by Md Juel Rana in (2017).

Below are the further estimations of this model.

➢ *Table*

Table 2 Feasible Generalized Least Squares model (FGLS)

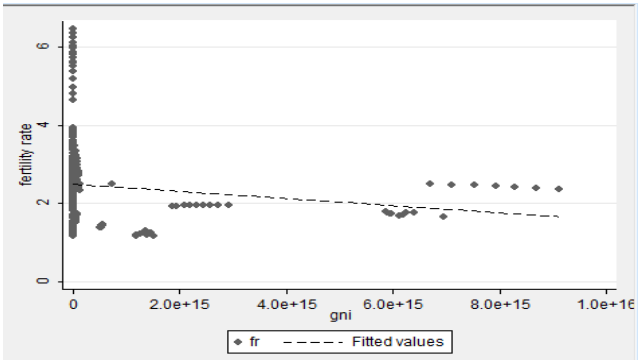
Cross Sectional Time-Series FGLS Regression Coefficient: Generalized Least Square Panel : Heteroskedastic Correlation : No Autocorrelation Estimated Covariance = 36 Estimated Autocorrelation = 0 Estimated Coefficients = 6	Number of Observation = 295 Number of Groups = 36 Observation per Group = 1 Average = 8.19444 Maximum = 9 Wald Chi2 (5) =550.71 Probability Value =0.0000

Dependent Variable	Variables Names	Coefficient	Standard Error	Z -value	P-value	95% Confidence interval	Interval
Independent variables	Fertility Rate	-1.00	1.41	-7.10	0.000	-1.28	-7.27
	Education Expenditure	0.1478	0.016	8.81	0.000	0.114	0.180
	Health Expenditure	-0.1530	0.022	-6.82	0.000	-0.1970	-0.1090
	Environment Performance Index	-0.0016	0.000	-1.94	0.052	-0.0032	0.000
	Trade	-0.0021	0.000	-6.58	0.000	-0.0027	-0.0014
	Governance	-0.055	0.000	-5.89	0.000	-0.0736	-0.0368
	Constant	2.3417	0.1016	23.04	0.000	2.1424	2.5409

- ***Interpretation:***

if there is one percent increase in fertility rate then gross national income will decrease by -1.00 percent. Second variable interpretation if there is one percent increase in fertility rate then education expenditure will increase by 0.1475 percent. Third variable interpretation if there is one percent change in fertility rate then health expenditure will decrease by -0.1530 percent. Fourth variable interpretation if one percent change in fertility rate then environment performance index will decrease by -0.0016%. Fifth variable if there is one percent increase in fertility rate then trade will decrease by -0.0021%. Last variable interpretation if there is one percent change in fertility rate then governance will decrease by -0.055 percent. We can see that all independent variable have significant impact and overall p-value is also significant. This model is the first solution of autocorrelation and heteroskedasticity. This model is better than fixed effect and random effect model.

➢ *Graphs*



Graphs 1 Fertility Rate and Gross National Income

- *Interpretation:*

In the above graph we can see that fertility rate and gross national income have negative relationship.

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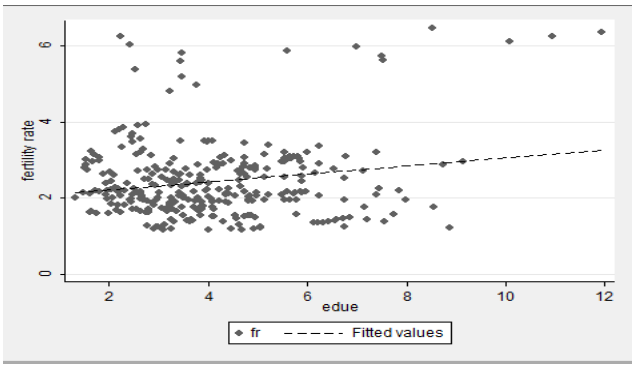
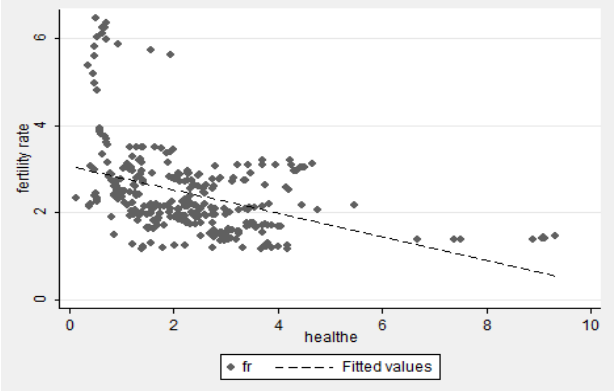


Graphs 2 Fertility Rate and Education Expenditure

- *Interpretation*:

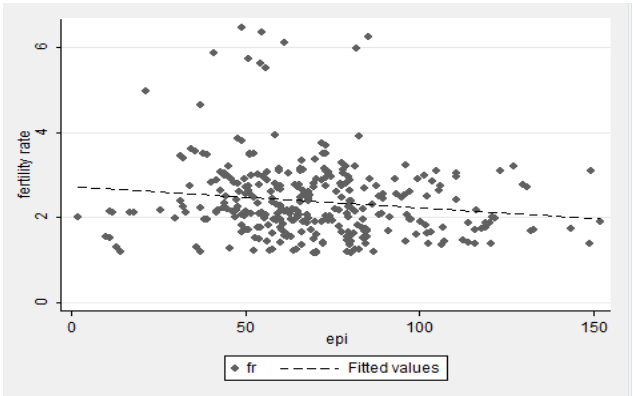
According to the above graph we can easily find out that fertility rate and education expenditure are positively correlate with each other.



Graphs 3 Fertility Rate and Health Expenditure

- *Interpretation:*

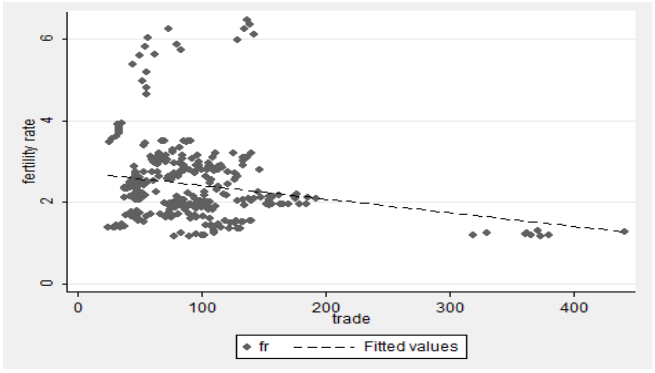
Above graph shows that negative relationship between fertility rate and health expenditure.



Graphs 4 Fertility Rate and Environment Performance Index

- *Interpretation:*

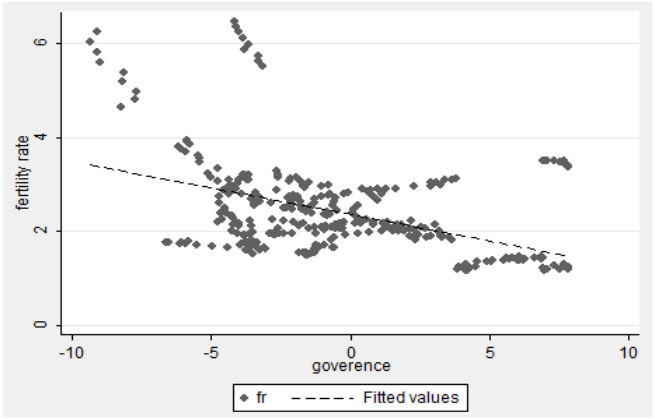
According to the above graph there is negative relationship between fertility rate and environment performance index.



Graphs 5 Fertility Rate and Trade

- *Interpretation:*

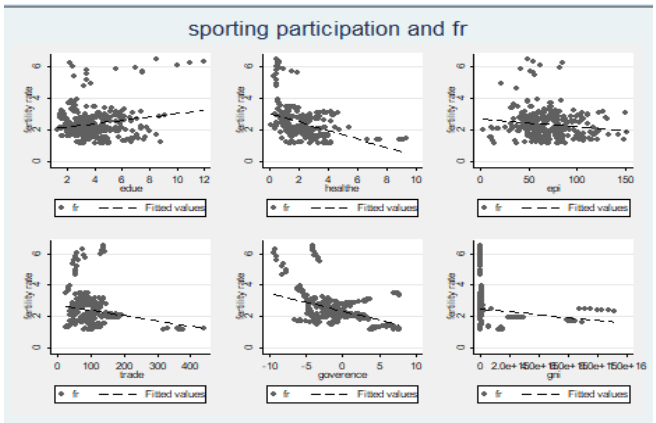
The above graph shows that fertility rate and trade these two variables are showing the negative relationship.



Graphs 6 Fertility Rate and Governance

- *Interpretation:*

This graph showing the negative relationship between fertility rate and governance



Graphs 7 Combine Graphs

- *Interpretation:*

The above combine graph shows that all independent variables showing negative relationship with fertility rate except education expenditure this variable shows positive relationship with fertility rate.

ISSN No:-2456-2165

XII. CONCLUSION AND POLICY IMPLEMENTATION

To conclude this research analysis we can say null hypothesis is accepted because there is no evidence of autocorrelation and Heteroskedasticity as presented in the table of Feasible Generalized Least Squares model (FGLS). Moreover fertility rate, health expenditure and education expenditure are the economic problems and there are many side effects in our economy. The above results are clearly telling that there is a need to focus more and more on health expenditure and education expenditure, trade balance good governance and better gross national income.

The results are telling that if fertility rate increase due to this reason gross national income decrease on the other hand when population will increase in this way government cannot spend more and more money on education sector and similarly health sector sector. So in this regard there is a need take serious steps by the State Bank of Pakistan and other countries domestic national bank and world bank to maintain interest rate. Because due to decrease in the rate of interest rate investment would be increased and in this way due to multiplier effect capital formation increase and similarly people get more and more jobs it will lead to up word gross national income and in a little while it would be at the desirable stage.

Trade sector raw material import is also leaving significant impacts on Asian trade because increase in it leads to decrease trade deficit Because it generates positive potential in the economy, many people get employment opportunities moreover production also goes up. For this purpose government should provide the subsidy for the agricultural imports because Pakistan's largest population is living in the rural area by this government can control rural unemployment. At present time there are so many development projects are going on in the country and it needs the resources in the results deficit financing happens due to government expenditure and it leads to increase the price of goods and consequently poor getting poorest. China is also taking interest in the economy of Pakistan and this country is also a major trade partner of Pakistan and CPEC project is also going on in here. In this way the each government are making the better policies for his country. The independent variables we can see that are affecting very well to the dependent variable and that's why the people of Pakistan are suffering from the increasing price level.

If we look at only one country of Pakistan then we can say that there are lots of potential to overcome each and every economic problem. If we talk about the policy implementation in the light of above results we can say that there is a need for the central bank to take serious steps to control these major problems. Asian countries should also focus on health and education sector it should observe the demand in the domestic market first and then in the foreign market in this way prices would be under control in the domestic market.

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