HEALTH STRUCTURE, NUTRITION AND ECONOMIC GROWTH IN PAKISTAN: A TIME SERIES ANALYSIS

KHALIL AHMAD[1], ISMAIL SENTURK[2]

ABSTRACT
This study tries to know the impact of health and nutrition on the economic growth of Pakistan from 1980 to 2013. Child health and nutrition are strongly associated with educational achievement. Less developed countries like Pakistan suffer from poor health and nutrition, and the problems facing by women of childbearing age. For all these purposes we apply the integration test innovation accounting approach to see the relationship between the variables. The recent study is a good effort and provides a new way to policymakers to solve the problems associated with health and nutrition. Pakistan's health care system is facing various issues like lack of knowledge or efficiency to overcome these issues. To check the stationarity Unit Root is used. The autoregressive distributed lag approach is used among the variables.

Keywords: health, nutrition, health care system, education
JEL Codes: I10, I20

I. INTRODUCTION
Health can play an important role in the economic growth of Pakistan and there is a strong relationship between health and economic growth. Good healthcare means a good economy. A good health care system is vital. It means the population has access to combat illness and therefore are no financial burdens, because of healthcare, on the country and the individual, due to reliable workforce. Factors such as GDP, life expectancy affects a country's growth. In less developed countries such as Pakistan feel the effect of an inefficient healthcare system, and this impacts economic growth. Health is the greatest gift, contentment the greatest wealth, faithfulness the best relationship. In all health care systems, the strategic policy formation should be based on information data that is related to health-promoting and utilization behavior. These behaviors mostly occur with an institutional structure like family community and health care services. These health behaviors are determined by some factors like physical, socio-economic, cultural, political, and education. Therefore, utilization of the health care system depends on the level of education, cultural beliefs, the status of women, and disease pattern. In the health care system, the private health sector has many differences. An ordinary human cannot afford health care services in the private sector. Hence public sector resources should be affordable for the ordinary. Unfortunately, Pakistan is facing various health issues. The health care system should be improved in the public sector and should be free for the poor. Another important factor is to educate people regarding health conditions. Women should know what she has to do in her pregnancy condition, what is better for her and her child. People should know about several fatal diseases like HIV aids, dengue fever, malaria, typhoid fever, measles, and diarrhea. People should have accurate information about health care choices. People should be well aware of preventive care that is childhood immunization i.e. for polio, measles. People should be convinced that vaccines are really important to prevent diseases. This paper reviews the education of women and their children and health care.

II. LITERATURE REVIEW
Jalil et al., (1993) examined early child health in Lahore, Pakistan. In this paper, details were given of a community-based follow-up study of four areas like a village, a peri-urban slum, an urban slum, and an upper-middle-class control group were living in and around Lahore, Pakistan. The aim was to characterize the determinants of child health in a

[1] Govt Civil Lines College Lahore, Govt of Punjab, Pakistan.
[2] Department of Economics, Tokat Gaziosmanpaşa University, Turkey.

rapidly urbanizing community. The study was undertaken in two steps. An initial cross-sectional survey collecting socio-economic and demographic background information was carried out between March to August 1984. This was followed by a longitudinal study of 1476 infants representing the outcome of the pregnancies registered continuously between September 1984 to March 1987 among the 3242 families in the study. These infants were followed monthly from birth to 3 years of age and thereafter less frequently. In this communication, this paper described the study design, the study population, the organization, and the research methodology used, including the reasons for dropouts from birth to 24 months of age. The internal consistency of the data was also presented. After the initial examination of the newborns within between 0–7 days of birth, the infants were visited monthly for 24 months making a total of 20911 examinations. At 24 months of age, 70% of the infants were still in the study, 11% had died before reaching this age, 13% had moved from the area and 6% had refused to participate in the study. The economic, conditions, social structure, and quality of life were found, not surprisingly, to vary significantly among the four areas. This community-based project provides new, critical, and reliable information for local health planners. The study highlights the importance of the development of a useful model for research collaboration between institutions in developed and developing countries.

Gowani et al., (2014) examined the cost-effectiveness of responsive stimulation and nutrition interventions on early child development outcomes in Pakistan. This study aimed to look at the costs and effectiveness of a cluster-randomized effectiveness trial on children from birth to 24 months in rural Sindh, Pakistan. Responsive stimulation and enhanced nutrition interventions were integrated into the Lady Health Worker program in Pakistan. Outcomes suggest that children who received responsive stimulation had significantly better development outcomes at 24 months than those who only received enhanced nutrition intervention. A mixed-method approach was used to collect data to inform the costing analysis. The analysis suggests that, with further refinement, integrating early stimulation with nutrition support can be scaled-up effectively; based on existing data in other settings, the cost-benefit to the country could be very significant.

Rahman et al., (2004) examined the mothers' mental health and infant growth, a case-control study from Rawalpindi, Pakistan. This study aimed to determine whether poor maternal mental health is associated with an increased risk of infant undernutrition. A clinic-based case-control study. A total of 172 consecutive infants and their mothers attending for 9-month measles immunization were recruited over 3 months. Early recognition and treatment of mental health problems in mothers may help reduce morbidity and mortality rates in children. Griffiths et al., (2004) examined incremental cost-effectiveness supplementary immunization activities to prevent neonatal tetanus in Pakistan. This study aimed to estimate the incremental cost-effectiveness of supplementary immunization activities to prevent neonatal tetanus in the Loralai district of Pakistan. The supplemental immunization activities were carried out in two phases during 2001–03. A state-transition model was used to estimate the effect of routine vaccination with tetanus toxoid as well as vaccination with tetanus toxoid during supplementary immunization activities. Data on the costs of the activities were collected from the UNICEF office in Balochistan and the Provincial Health Department. Compared with similar analyses of other interventions, the cost per DALY averted was a favorable cost-effectiveness ratio.

Hanif (2011) examined breastfeeding and complementary feeding practices in Pakistan. This paper aimed to evaluate the effectiveness of these programs. Estimates on the various indicators for infant and young child feeding proposed by WHO were analyzed in light of the Pakistan Demographic and Health Surveys (1990-91 and 2006-07) and several other national studies conducted since 1995. Nearly half the core and optional indicators had improved over the years, though modestly; the others have demonstrated no statistically significant improvement over the years. Further programs should focus on improving the following indicators that have shown no significant development, early initiation of breastfeeding, exclusive breastfeeding under six months, continued breastfeeding at two years, age-appropriate feeding, and bottle feeding.

Bhutta et al., (1999) examined the prevention of diarrhea and pneumonia by zinc supplementation in children in developing countries. This study assessed the effects of zinc supplementation in the prevention of diarrhea and pneumonia with the use of a pooled analysis of randomized controlled trials in children in developing countries. The effects on diarrhea and pneumonia were analyzed overall and in subgroups defined by age, baseline plasma zinc concentration, nutritional status, and sex. The analysis used random-effects hierarchical models to calculate odds ratios (OR) and 95% CIs. No significant differences were seen in the effects of the zinc supplement between the subgroups

examined for either diarrhea or pneumonia. Zinc supplementation in children in developing countries associated with substantial reductions in the rates of diarrhea and pneumonia, the 2 leading causes of death in these settings.

Khan and Heuvel (2007) examined the impact of political context upon the health policy process in Pakistan. Analysis of the political context was important for the understanding of a health policy and its success, because contextual factors may significantly influence the health policy process and health. This article described how the political context in Pakistan influences the health policy process. The analysis-based on document analysis and interviews of relevant actors in analyzing the impact of the political context on the health policy process. Document analysis included policy documents and official reports of the health ministries, health-related departments, and international agencies. Interviewees included relevant actors involved in the health policy process at local, provincial, national, and international levels. Pakistan experienced unbalanced power structures and frequent changes in government, which has disturbed health resources and has resulted in a centralized health system that hinders wider participation and disrupts health policy-making, planning, and implementation. It was concluded that the political context has had a negative influence on the health policy process in Pakistan.

Hasan et al., (2000) examined health care utilization during terminal child illness in squatter settlements of Karachi. Information on health-seeking behavior and health care utilization had important policy implications in health systems development. This study presented some of the issues related to health care utilization and health-seeking behavior in the case of terminal Child illness in seven squatter settlements of Karachi. From seven squatter settlements of Karachi, with a population of 100,000 approximately, this paper collected information, using a pretested structured questionnaire, from the mothers on health care utilization during the final illness of under-five children dying during 1995-1996. These deaths were identified from earlier baseline health and demographic survey in these areas. Interviews were completed for 259 infant and child deaths of which 57% were boys. Of all deaths, 72 % were taken to a health care provider, of which 82% went as soon as the child got ill. Living in urban areas did not ensure access to effective health care. The private sector constituted an important segment of our health care system, which requires strengthening and backup support.

Hossain et al., (2011) examined the high prevalence of vitamin D in Pakistani mothers and their newborns. This study determined the prevalence of vitamin D deficiency in Pakistani parturient and their newborns and assess the correlation between maternal and newborn serum levels of the vitamin D metabolite 25-hydroxy vitamin D3. A prospective study of parturient presented to the labor suite with a singleton pregnancy. Maternal and cord blood were collected for estimation of serum 25-hydroxy vitamin D3. In total, 89% of the gravidae were deficient in vitamin D (serum 25-hydroxy vitamin D3 < 30 ng/mL). There was a positive correlation between maternal and cord blood 25-hydroxy vitamin D3 levels ($r = 0.68$; $P < 0.001$). There was a high prevalence of vitamin D deficiency in the Pakistani parturient and their newborns. There was a correlation between higher maternal vitamin D levels and lower blood pressure in the mothers.

Rizvi et al., (2014) examined gender shaping the personality, lives, and health of women in Pakistan. This paper determined the reasons for reiteration of gender roles; describes the societal processes and mechanisms that reproduce and reinforce them, and identifies their repercussions on women's personality, lives, and health especially reproductive health. As part of a six-country study titled 'Women's Empowerment in Muslim Contexts', semi-structured group discussions ($n = 30$) were conducted with women ($n = 250$) who were selected through snowballing from a different age, ethnic and socio-economic categories. The society study had constructed a 'Model' for women that consider them 'Objects' without rights and autonomy. Women's subordination, a prerequisite to ensure compliance to the constructed model, was maintained through the allocation of lesser resources, restrictions on mobility, seclusion norms, and even violence in cases of resistance. Improvement in women's health was bound to have positive influences on their children and wider family's health, education, and livelihood; and in turn on a society's health and economy.

Ansari et al., (2008) examine anemia prevalence and risk factors in pregnant women in an urban area of Pakistan. Anemia is one of the most common nutritional deficiency diseases observed globally. This study aimed to determine the prevalence of anemia and the dietary and socioeconomic factors associated with anemia in pregnant women living in an urban community setting in Hyderabad, Pakistan. This was a cross-sectional analytic study, nested in a prospective population-based cohort study conducted in Pakistan to assess the association of various maternal

characteristics with pregnancy outcomes. This was a prospective, observational study of 1,369 pregnant women enrolled at 20 to 26 weeks of gestation and followed to 6 weeks postpartum. Women of childbearing age should be provided nutritional education regarding food sources of iron, especially before becoming pregnant, and taught how food choices can either enhance or interfere with iron absorption.

Arif (2014) examines the health status of Pakistani children using two important indicators, morbidity and malnutrition measured by weight-for-age and height-for-aged. The main data source used in this study is the 2000-01 Pakistan Social-Economic Survey (PSES), which provides sufficient information on child health and poverty. This study had made a contribution to the existing literature in understanding the relationship between child health, poverty, and the utilization of medical services. It had focused on two important indicators of child health; illness, and malnutrition measured by weight-for-age and height-for-age. The other major finding of this study was the strong correlation between immunization and child health.

Iram and Butt (2006) examine the health and nutritional status of children in Pakistan. The main purpose of this paper was to increase the level of knowledge about the nutritional status of preschoolers and to identify/quantifying the relative importance of various socioeconomic and environmental factors which may have a significant role in determining the nutritional status of preschoolers in Pakistan. Household food availability, childcare practices, and child health status being focused as proximate determinants of child nutritional status pose problems for the simple regression analysis, by using ordinary least squares (OLS) estimation of the regression with nutrition as an outcome. Child malnutrition had long been recognized as a serious problem in developing countries like Pakistan. This finding suggested that women's education and literacy programs could play a very important role in improving children's nutritional status.

Nizami et al., (1999) examine zinc supplementation in malnourished children with persistent diarrhea in Pakistan. The objective was to evaluate the potential benefit of dietary supplementation of a rice-lentil (Khichri) and yogurt diet with 3 mg/kg/d of elemental zinc (as zinc sulfate) in hospitalized malnourished children (age 6–36 months) with persistent diarrhea for 14 days by using the randomized, double-blind placebo-controlled trial. A total of 114 children presented to the ambulatory care services at NICH with a history of PD, who consented to be admitted to the study ward for rehabilitation and randomization. Of these, 14 did not have any significant diarrhea during the stabilization period (formed stools with a volume,20 g/kg/d) and were discharged. A further 13 children could not be stabilized during the stabilization period and at the end of 24 hours were either still in need of IV rehydration or unable to take full oral feeds because of concomitant infections. They were thus excluded from the study and transferred to the pediatric ward for further intensive care as indicated. Of the 87 children thus randomized for allocation to the two treatment groups, 4 (2 in zinc and 2 in placebo groups, respectively) could not stay for the stipulated 14 days in the ward and were discharged prematurely; a further 6 children were removed from the study at different stages because of development.

Barrera (1989) examined the interactive effects of a mother's schooling and supplemented breastfeeding on child health. This paper estimated a nonlinear relationship between duration of breastfeeding and child height-for-age. For this sample of children, health benefits from supplemented breastfeeding differ by mother's education, with children of less-educated mothers deriving the most gains. These results suggested that more educated mothers can provide wholesome substitutes to breast milk without producing ill effects. Results were sensitive to the estimation technique used, with 2SLS estimates, shown statistical significance and substantial health gains compared to OLS estimates. The use of a linear specification for breastfeeding was inappropriate and can lead to the misleading inference that health benefits from breastfeeding were minimal and/or statistically insignificant.

III. THE ECONOMIC MODEL AND METHODOLOGY

The objective of this paper is to investigate the relationship between Gross domestic product constant, Final consumption expenditure, School enrollment, and Immunization on Life expectancy at the birth rate of Pakistan for the period 1980 to 2013 using the (ARDL) model. Ali (2011), Ali (2015), Ali (2018), Ali and Bibi (2017), Ali and Ahmad (2014), Ahmad and Ali (2016), Audi and Ali (2016), Ali and Audi (2016), Ali and Audi (2018), Ali and Rehman (2015), Audi and Ali (2017), Ali and Naeem (2017), Audi and Ali (2017), Ali and Zulfiqar (2018), Ali et al., (2016), Arshad and Ali (2016), Ashraf and Ali (2018) Haider and Ali (2015), Sajid and Ali (2018), Ali and Senturk

(2019), Kassem et al, (2019), Ali and Bibi (2020), Sulehri and Ali (2020) and Audi et al., (2021), following the basic model in economic and econometrics literature, the study adopts the model below:
Y=f(GDPCONST, FINALCONSP, SCEN, IMMN)
where; y is Life expectancy at the birth rate of Pakistan
GDPCONST= Gross domestic product constant
FINALCONSP=Final consumption Expenditure
SCEN= School enrollment
IMMN=Immunization measles (% 12-21 months age children)

IV. EMPIRICAL RESULTS

In Table 1, descriptive statistics are given to overview the properties of selected data. According to the estimated results LEXP, GDP CONST and IMMUNIZATION are negatively skewed but final consumption and school enrollment are positively skewed. But the results reveal that all the variables have positive kurtosis. According to estimated results, skewness and kurtosis are insignificant and different from zero. So, we reject the null hypothesis of having no normality. JACQUE-BERA value reveals that all variables have finite covariance and zero mean. So, we conclude that the selected data are normally distributed.

Table 1: Descriptive statistics

	L_EXP_AT…	GDP_CONS..	FINAL_CON..	SCHOOL_E	IMMUNIZATI..
Mean	61.70960	23.83786	6.98E+11	8.566292	49.73529
Median	61.87826	24.38513	3.64E+11	8.550983	52.50000
Maximum	65.96368	29.78608	3.21E+12	9.494617	73.00000
Minimum	57.03724	12.19961	2.98E+10	7.630461	1.000000
Std. Dev.	2.635318	3.606880	8.44E+11	0.486967	18.82022
Skewness	-0.131664	-1.311674	1.569901	0.087111	-1.413030
Kurtosis	1.867974	5.219987	4.599540	2.365878	4.390453
Jarque-Bera	1.913669	16.73126	17.59058	0.612657	14.05329
Probability	0.384107	0.000233	0.000151	0.736145	0.000888
Sum	2098.126	810.4871	2.37E+13	291.2539	1691.000
Sum Sq. Dev.	229.1818	429.3163	2.35E+25	7.825514	11688.62
Observations	34	34	34	34	34

Mostly time series data has a non-stationary problem and the estimated regression results of this data became spurious for policy suggestion. All co-integration methods also demand the stationarity of the variables. This study comprises the different econometrics method or used different tests to show our result in stationary or significant, the fact of time series data that it contains unit root problem and regression results of this data are spurious. For the solution of the unit root problem, this study uses the Augmented Dickey-Fuller (ADF) unit root test, the calculated results of the ADF test are presented in this paper.

Table 2: Unit Root Test

	At Level		At 1st Difference	
Variables	T-Statistics	P-Value	T-Statistics	P-Value
LEX	-0.196674	0.9291	-9.57462	0.0000
GDPCONST	-3.877406	0.0056	-4.785067	0.0005
FINALCONSP	2.317262	0.9999	2.871619	0.0001
SCEN	-1.646536	0.7533	4.156284	0.0126
IMMN	-3.250386	0.0258	-4.963831	0.0003

Augmented Dicky Fuller (ARDL) test is used for checking the stationary of variables. Results reported in the table are describing that variables LEXP FINALCONSP and SCEN are stationary at 1st difference. Whereas GDPCONST and IMMN are stationary at Level. Hence there is a mixed order of integration among the variables of the model which is a suitable condition for applying the Auto-Regressive Distributed Lag (ARDL) bound testing approach to co-

integration. Variables are considered: Life Expectancy birth rate, Gross domestic product constant, Final Consumption expenditure, School enrollment, Immunization.

Table 3: Bound Test Result

F-statistics= 25.63242		
Level of significance	**Lower bound value**	**Upper bound value**
5%	2.45	3.52
10%	2.86	4.01

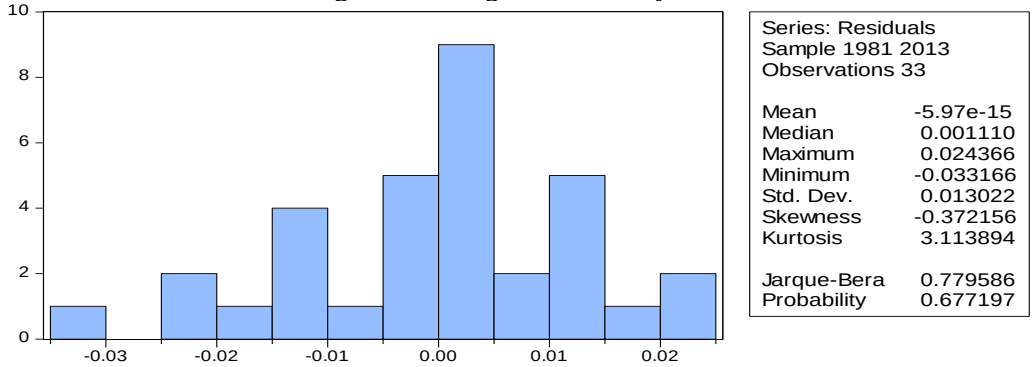
The result of the Bounding Testing is represented in Table 3. The results of Bounding Testing show the F-statistics is greater than the upper bound value at 5% so there is co-integration among the variables of the model.

Table 4: Long Run Result of Co-integration

Dependent variable= LEXP			
Variable	Coefficient	t-statistics	p-value
LEXP	43.835005	4.084734	0.0004
GDPCONST	-0.053679	-1.186864	0.2456
FINALCONSP	0.000000	1.323624	0.1967
SCEN	3.161051	2.561948	0.0163
IMMN	0.000796	0.038351	0.9697

The long-run results of the study are presented in Table 4. The results show that the gross domestic product constant is insignificant and hurts life expectancy. The estimated result shows that final consumption is insignificant and has a positive relationship with life expectancy, the school enrollment is significant and has a positive relationship with life expectancy. Finally, immunization is an insignificant and positive relationship with the dependent variable (life expectancy).

Figure-1: Histogram Normality Test



In this graph, the estimated results of the values of the JACQUE-BERRA normality test at 5% significant level so the Ho is the normality of residuals of the values of J-B is greater than 5% so we are unable to reject Ho and conclude that residuals are normally distributed among the variables, and in the AC, the P-value is greater than 5% so we conclude that there is no autocorrelation among the variables. In the case of HETRO, the estimated results show that there is no HETRO because P-value is greater than the 5% significance level.

Table 7. RAMSEY-RESET Test

Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	0.488662	22	0.6299	
F-statistic	0.238791	(1, 22)	0.6299	
F-test summary:				
	Sum of Sq.	df	Mean Squares	
Test SSR	5.83E-05	1	5.83E-05	
Restricted SSR	0.005426	23	0.000236	
Unrestricted SSR	0.005368	22	0.000244	

The value of RAMSEY-RESET shows that our model is correct.

The stability of the model provides information related to the estimated model of economic growth. The results of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) test are described in Fig 1 and Fig 2. These figure that cumulative sum (CUSUM) and the cumulative sum of the square (CUSUMSQ) lie mid the two critical lines which shows that the estimated model is stable.

Figure 2:

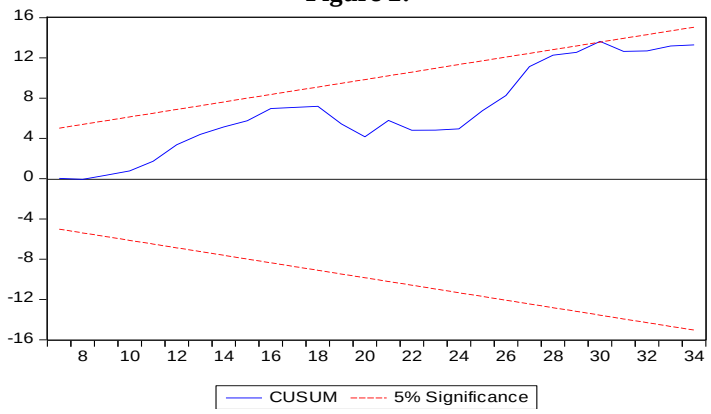
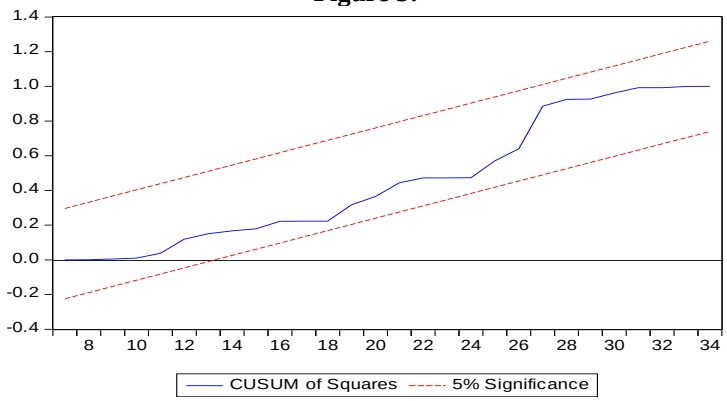


Figure 3:



V. CONCLUSIONS

The result of the ARDL bound test testing shows that there is co-integration among the variables of the model. The Long-Run Results show that the given domestic product constant is insignificant and hurts life expectancy. The estimated result shows that final consumption is insignificant and has a positive relationship with life expectancy. The school enrollment is significant and has a positive relationship with life expectancy, and finally, immunization is an insignificant and positive relationship with the dependent variable (life expectancy). This study concludes government plays a vital role to overcome the health issues in Pakistan. This finding suggests that women's education and literacy

programs could play a very important role in improving a child's health and nutritional status. There is a need to employ female workers. Public health awareness programs should be organized for mothers. Mothers should be educated to understand the disease process and the difference between favorable and unfavorable health practices. Policymakers must understand the behavior and issues related to it. For this purpose, the government should adopt policies, rules, and regulations to overcome such issues related to health.

REFERENCES

Ahmed, K., & Ali, A. (2016). Rising Population and Food Insecurity Linkages in Pakistan: Testing Malthusian Population Growth Theory. *International Journal of Economics and Empirical*, 4 (1), 1-8.

Ali, A. & Naeem, M.Z. (2017). Trade Liberalization and Fiscal Management of Pakistan: A Brief Overview. *Policy Brief-Department of Economics, PU, Lahore*. 2017 (1), 1-6.

Ali, A. (2011). Disaggregated import demand functions of Pakistan; An empirical Analysis. M-Phil Thesis, NCBA&E, Lahore, Pakistan, 1-70.

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. (2018). Issue of Income Inequality Under the Perceptive of Macroeconomic Instability: An Empirical Analysis of Pakistan. *Pakistan Economic and Social Review*, 56(1), 121-155.

Ali, A. and Bibi, C. (2017). Determinants of Social Progress and its Scenarios under the role of Macroeconomic Instability: Empirics from Pakistan. *Pakistan Economic and Social Review* 55 (2), 505-540.

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., & 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*, 4 (4), 182-193.

Ali, A., & Audi, M. (2018). Macroeconomic Environment and Taxes Revenues in Pakistan: An Application of ARDL Approach. *Bulletin of Business and Economics* (BBE), 7(1), 30-39.

Ali, A., & Rehman, H. U. (2015). Macroeconomic instability and its impact on the gross domestic product: an empirical analysis of Pakistan. *Pakistan Economic and Social Review*, 285-316.

Ali, A., & Şenturk, İ. (2019). Justifying the Impact of Economic Deprivation, Maternal Status and Health infrastructure on Under-Five Child Mortality in Pakistan: An Empirical Analysis. *Bulletin of Business and Economics*, 8(3), 140-154.

Ali, A., & Zulfiqar, K. (2018). An Assessment of Association between Natural Resources Agglomeration and Unemployment in Pakistan. *Pakistan Vision*, 19(1), 110-126.

Ali, A., Ahmed, F., & Rahman, F. U. (2016). Impact of Government Borrowing on Financial Development (A case study of Pakistan). *Bulletin of Business and Economics* (BBE), 5(3), 135-143.

Ali, A., Mujahid, N., Rashid, Y., & Shahbaz, M. (2015). Human capital outflow and economic misery: Fresh evidence for Pakistan. *Social Indicators Research*, *124*(3), 747-764.

Arif, G. M. (2004). Child health and poverty in Pakistan. *The Pakistan Development Review*, 211-238.

Arshad, S., & Ali, A. (2016). Trade-off between Inflation, Interest and Unemployment Rate of Pakistan: Revisited. *Bulletin of Business and Economics (BBE)*, *5*(4), 193-209.

Ashraf, I., & Ali, A. (2018). Socio-Economic Well-Being and Women Status in Pakistan: An Empirical Analysis. *Bulletin of Business and Economics (BBE)*, 7(2), 46-58.

Audi, M & Ali, A. (2017). Socio-Economic Status and Life Expectancy in Lebanon: An Empirical Analysis. *Archives of Business Research*, 5(11), 159-170

Audi, M. & Ali, A. (2017). Environmental Degradation, Energy consumption, Population Density and Economic Development in Lebanon: A time series Analysis (1971-2014). *Journal of International Finance and Economics*, 17(1), 7-20.

Audi, M. Ali, A. & Roussel, Y. (2021). Aggregate and Disaggregate Natural Resources Agglomeration and Foreign Direct Investment in France. *International Journal of Economics and Financial Issues*, 11(1), 147-156.

Audi, M., & Ali, A. (2016). A Causality and Co-integration Analysis of Some Selected Socio-Economic Determinants of Fertility: Empirics from Tunisia. *Bulletin of Business and Economics (BBE),* 5(1), 20-36.

Baig-Ansari, N., Badruddin, S. H., Karmaliani, R., Harris, H., Jehan, I., Pasha, O., ... & Goldenberg, R. L. (2008). Anemia prevalence and risk factors in pregnant women in an urban area of Pakistan. *Food and nutrition bulletin*, 29(2), 132-139.

Barrera, A. (1990). The interactive effects of mother's schooling and supplemented breastfeeding on child health. *Journal of Development Economics*, *34*(1-2), 81-98.

Bhutta, Z. A., Black, R. E., Brown, K. H., Gardner, J. M., Gore, S., Hidayat, A., ... & Rosado, J. L. (1999). Prevention of diarrhea and pneumonia by zinc supplementation in children in developing countries: pooled analysis of randomized controlled trials. *The Journal of pediatrics*, *135*(6), 689-697.

Bhutta, Z. A., Nizami, S. Q., & Isani, Z. (1999). Zinc supplementation in malnourished children with persistent diarrhea in Pakistan. *Pediatrics*, 103(4), e42-e42.

Gowani, S., Yousafzai, A. K., Armstrong, R., & Bhutta, Z. A. (2014). Cost effectiveness of responsive stimulation and nutrition interventions on early child development outcomes in Pakistan. *Annals of the New York Academy of Sciences*, *1308*(1), 149-161.

Griffiths, U. K., Wolfson, L. J., Quddus, A., Younus, M., & Hafiz, R. A. (2004). Incremental cost-effectiveness of supplementary immunization activities to prevent neonatal tetanus in Pakistan. *Bulletin of the World Health Organization*, *82*(9), 643-651.

Haider, A., & Ali, A. (2015). Socio-economic determinants of crimes: a cross-sectional study of Punjab districts. *International Journal of Economics and Empirical Research*, 3(11), 550-560.

Hanif, H. M. (2011). Trends in breastfeeding and complementary feeding practices in Pakistan, 1990-2007. *International Breastfeeding Journal*, *6*(1), 15-20.

Hasan, I. J., & Khanum, A. (2000). Health care utilization during terminal child illness in squatter settlements of Karachi. *J Pak Med Assoc*, *50*(12), 405-409.

Hossain, N., Khanani, R., Hussain-Kanani, F., Shah, T., Arif, S., & Pal, L. (2011). High prevalence of vitamin D deficiency in Pakistani mothers and their newborns. *International Journal of Gynecology & Obstetrics*, *112*(3), 229-233.

Iram, U., & Butt, M. S. (2006). Understanding the health and nutritional status of children in Pakistan: A study of the interaction of socioeconomic and environmental factors. *International Journal of Social Economics*, 33(2), 111-131.

Jalil, F., Lindblad, B. S., Hanson, L. A., Khan, S. R., Ashraf, R. N., Carlsson, B., ... & Karlberg, J. (1993). Early child health in Lahore, Pakistan: I. Study design. *Acta Paediatrica*, *82*(s391), 3-16.

Kassem, M. Ali, A. & Audi, M. (2019). Unemployment Rate, Population Density and Crime Rate in Punjab (Pakistan): An Empirical Analysis. *Bulletin of Business and Economics (BBE)*, 8(2), 92-104.

Khan, M. M., & Van den Heuvel, W. (2007). The impact of political context upon the health policy process in Pakistan. *Public Health*, *121*(4), 278-286.

Rahman, A., Lovel, H., Bunn, J., Iqbal, Z., & Harrington, R. (2004). Mothers' mental health and infant growth: a case–control study from Rawalpindi, Pakistan. *Child: care, health and development*, 30(1), 21-27.

Rizvi, N., Khan, K. S., & Shaikh, B. T. (2014). Gender: shaping personality, lives and health of women in Pakistan. *BMC women's health*, *14*(1), 53-62.

Sajid, A. & Ali, A. (2018). Inclusive Growth and Macroeconomic Situations in South Asia: An Empirical Analysis. *Bulletin of Business and Economics (BBE)*, 7(3), 97-109.

Sulehri, F. A., & Ali, A. (2020). Impact of Political Uncertainty on Pakistan Stock Exchange: An Event Study Approach. *Journal of Advanced Studies in Finance*, 11(2), 194-207.