Asesorías y Tutorías para la Investigación Científica en la Educación Puig-Salabarría S.C.
José María Pino Suárez 400-2 esq a Lerdo de Tejada. Toluca, Estado de México. 7223898475
RFC: ATI120618V12

Revista Dilemas Contemporáneos: Educación, Política y Valores.
http://www.dilemascontemporaneoseducacionpoliticayvalores.com/
Año: VI Número: Edición Especial. Artículo no.:133 Período: Junio, 2019.

TÍTULO: "No estoy sobrepoblado"; Pakistán. Efecto positivo del crecimiento de la población en el desarrollo económico de Pakistán.

AUTORES:

1. Lecturer. Irfan Ullah Khan.

2. Assist. Prof. Muhammad Shahzad Iqbal.

3. Assoc. Prof. Dr. Khalid Mahmood Mughal.

RESUMEN: En general, se creía que el crecimiento poblacional tiene efecto negativo en el desarrollo económico, pero desde la última década, los economistas insisten en que este crecimiento desempeña un papel importante en el desarrollo económico debido a su efecto positivo en las variables macroeconómicas. El presente estudio investiga la relación positiva del crecimiento poblacional y desarrollo económico. El estudio utilizó datos secundarios del censo de población mundial 1981 al 2015. Se utilizó el software E-views para analizar la situación. Los hallazgos muestran una relación positiva entre la población y el desarrollo económico; por lo que el crecimiento poblacional no es malo en absoluto. El eslogan parece ser cierto: "no estoy sobrepoblado".

PALABRAS CLAVES: crecimiento poblacional, desarrollo, macroeconomía.

TITLE: “I am not overpopulated”; Pakistan. Positive effect of population growth on economic development of Pakistan.

AUTHORS:

1. Lecturer. Irfan Ullah Khan.

2. Assist. Prof. Muhammad Shahzad Iqbal.

3. Assoc. Prof. Dr. Khalid Mahmood Mughal.

ABSTRACT: Generally, it was believed that the population growth has negative effect on economic development, but from the last decade, economists insist that population growth plays an important role in economic development due to its positive effect on macroeconomic variables. The current study investigates the positive relationship of population growth and economic development. The study used secondary data from world population census period 1981 to 2015. E-views software was used to analyse the situation. Findings show positive relationship between population and economic development; thus, population growth is not bad at all. The slogan is look to be true that, “I am not overpopulated”.

KEY WORDS: population growth, development, macroeconomy.

INTRODUCTION.

Malthus (1798) presented his well-known theory of population, which stated that whereas population growth in geometrical series, food resources increased in mathematical series. He further added that it was basic to control population growth through 'preventive checks', which included moral restraint, late marriages, etc. Malthus warned that if this was not done, then nature would apply its own crude methods (called 'positive checks' by Malthus) to reduce population from

its higher level. These positive checks included epidemics, floods, earthquakes, droughts and other natural calamities (Allen, 1988).

The theory presented by Malthus (1798) had created an alarm during his own lifetime. Later on, economists declared him ‘false prophet', arguing that food produce no longer increase arithmetical progression, since agricultural output could now be increased to any level, with the help of exact methods of cultivation and modern technology (Woodruff, 1997).

For many years, development economists and social scientists have debated the significance of the cost of rapid population growth. Those who are of the view that rapid population growth is not a real problem have offered three arguments: Population growth is not a problem but there are other issues. Population growth cut is a plan of the capitalists’ countries to keep developing countries in their dependence. For many developing countries, population growth is desirable (Mason, 2001).

Agriculture sector is the largest source of employment in Pakistan with approximately 45 percent share of total labor force. The employment share by manufacturing sector has increased from 13.2 percent in 2009-10 to13.7 percent in 2010-11. The government is making sincere efforts to boost overseas employment. The number of migrant was 0.45 million in the year 2011, which has increased to 0.63 million in the year 2012 which include 0.26 million unskilled, 0.26 million skilled, 0.1 million semi-skilled workers (Mushtaq, 2006).

Japan has a surface area of 378,000 km compare to 796,000 km of Pakistan and it had a population of 126 million compare to 132 million of Pakistan (according to census of the year 1998). Still, Japan did not believe itself as overpopulated and it has the second highest GNP per capita in the world. This is because Japan had been able to develop its industrial sector fully, which provide employment to the size of its workforce (Manan et al., 2013).

A more current and scientific theory of population, known as the optimum theory of population, had received significant thanks from the present-day economists. It declared that, for every country, there was a certain optimum level of population which, at a given point of time, was required to utilize and use its resources in the best possible manner (Afzal, 2009). These economists, also said, that the use of contraceptives in current times had made it probable to check population growth successfully. The 'preventive checks' and 'positive checks' introduce by Malthus had, therefore, now become irrelevant and past (Linden, 2011).

According to the financial review of Pakistan years 2012-2013, the relationship of population detail and figures released by Population Reference Bureau displays that the world population growth rate decreased from 1.4% in 2011 to 1% in 2012. Urban population has increased to 69.87 million (2012-13) from 67.5 million in 2011-12 while rural population has increased to 114.4 million (2012-13) from 113.1 million in 2011-12 The total labor force has increased to 57.24 million in 2010-11 as compared to last year 56.33 million. The total number of people employed during 2010-11 was 53.84 million, 0.63 million more than the past year (Afzal & Farah, 2011).

Population growth rate has shown decline from 2.03 percent (2011-12) to 2.0 percent in 2012-13. Pakistan’s population has grown at an average rate of 3% per annum since 1951 up to mid-1980s, but it slow to an average rate of 2.6% per annum for the period of 1986-2000, and since 2001, it is increasing at an average rate of more or less 2% per annum. Pakistan’s population has grown at 2% since 1960. Pakistan’s per capita income would have been Rs. 64366 as against Rs. 43748. During the five decades 1950- 2001 (GOP, 2012).

If the population was below the optimum level, the resources of the country would remain partly unemployed and unutilized. On the contrary, if the population was above the optimum level, a certain percentage, of the country's population was likely to remain unemployed (Summer, 2002).

This theory was more sensible, since it took into thought both the relevant factors namely a country's population and its resources. Moreover, it exactly acknowledged that neither a higher population was always a curse, nor a lower population was always a blessing (Ahmad, 2002).

The research intends to show that how the population growth affects the economic growth of Pakistan and how the population increases the growth of the economy. Malthusian economists usually oppose population growth as it puts pressure on economic resources that leads social evils and natural calamities. They talk little of underpopulation and its consequences. The study intends to test the following hypothesis.

H_0: There is significant relationship between population and the GDP.

H_1: There is no relationship between Population and GDP.

DEVELOPMENT.

Some past literature.

In recent years, reliable time-series data sets that are extensive enough to agree to conduct time-series regression analyses have been increasingly available. The availability of the good quality data sets has stimulated further research on the relationship between population growth and economic development (Dawson & Tiffin, 1998).

The time-series data was taken to analyze a long-run relationship between population growth and economic development in India. They used the augmented Dickey-Fuller (ADF) unit root test and the Johansen (1988; 1991) co integration test to analyses the co-integrating relationships between the two variables. However, the study did not spot a long-run equilibrium relationship between the population expansion and economic performance in India. As the researchers concluded, Population growth neither causes per capita income growth nor is caused by it (Dawson &Tiffin, 1998).

While very few authors have the estimation that there is a positive impact of demographic factors on savings, Kinugasa, (2004), Tang and Zhang, (2007) observed that when income increases, people save for health investment; health investment brings rise in life expectancy which in turn increases saving and human capital investment. Besides demographic variations, there are certain other factors, which are involved in the fluctuation in saving rate, such as, income, inflation, interest rate, economic growth, etc. Income is essential in the determination of aggregate savings of economy, which determines economic growth. Income is used for two purposes, for consumption and for savings. If income increases, keeping the inflation rate constant, the consumption and saving also would increase.

Brisk population growth is result of high fertility. It creates many social and economic problems. By field survey this study explores relation between fertility and education and tries to know the behavior of population toward fertility according to their education and literacy (Khan & Yousaf, 2013).

Population growth stimulates unemployment positively and inflation and FDI has negative impact on unemployment, and while the speed of population growth remains unchanged, its sources are different. In the past, population growth was driven by increasing numbers of children. Today, and in the future, it is driven by longer life expectance and the "base effect" of the previous population boom. There are just many more young families which have children. However, they have fewer of them (Rafiq, 2008).

There are many researches which highlight the impact of population growth on saving. Some authors support the view that there is positive and negative impact of population growth or other demographic factor (age structure, dependency ratio, etc.) on saving rate that offsets each other which results insignificant or not any change in savings (Atanda, et al., 2012, Easterlin, 1967, Sadik, 1997 and Rosen & Rafi, 1995).

Thomas et al. (2010) examine current account balance for eleven small rising market economies by using Ordinary Least square (OLS) technique on the sample period of years 1970–2008 and find the relationship between age distributions, national savings and the current account balance by using time-series and cross-section data for 100 countries. The results indicate substantial demographic effects, with increase in both the youth and old age dependency ratios are associated with lower saving rates. A life cycle perspective based on the fact that consumption pattern of people and their contributions change over the different stages of life. Specially, the ratio of consumption to production tends to be high for the youth and elderly and low for working-age adults (Bloom & Canning, 2011).

Different studies find out the relation between population growth and economic growth in Pakistan. According to Trang & Hieu (2011), there is negative relationship between population and economic growth. Increase in population growth rate directs to decline in economic growth. Capital intensity, stander of living and age structure are the main reason of negative effect.

The researcher used population growth inflation rate and FDI as explanatory variables. Population is not included in GDP. Only per-capita GDP takes population into consideration. So, if the population rise, you can expect total GDP to also rise since, as it pointed out, some of the new members of the population will be engaged in productive output. With the growth of the population outpacing the growth of GDP, the per-capita GDP will fall. This will mean that the average standard of living is falling (Savas, 2008).

Methodology.

The study is an attempt to answer the question that whether the population has positive impact on economic Development that GDP in this study or not. This model is used by Afzal (2009). Time series data is used for the period of 1981 to 2015.

Variables.

Variables of interest in this research study are Population (POP), Gross Domestic Product (GDP), Remittances (REM), Household Consumption Expenditures (HCE) and Foreign Direct Investment (FDI). Population of Pakistan is in Million and the units of all other variables are Million Dollars.

Model specification.

To find out the quantitative effect of explanatory variables on dependent variable, the following econometric model is used.

GDP = f (POP, REM, HCE, FDI) ……... (1)

$RGDP = \beta_0 + \beta_1 POP + \beta_2 REM + \beta_3 HCE + \beta_4 FDI + \mu$……. (2)

$LnRGDP = \beta_0 + \beta_1 LnPOP + \beta_2 LnREM + \beta_3 LnHCE + \beta_4 LnFDI + \mu$ ……... (3)

β_0 β_1, β_2, $\beta_3$and β_4 are the parameters of the model where GDP = Gross Domestic Product, POP= Population, REM = Remittances, HCE = Household Consumption Expenditures and FDI = Foreign Direct Investment. And β_0 is an intercept term β_1, β_2, β_3 and β_4 are the elasticities of Population, Remittances, Household Consumption Expenditures and Foreign Direct Investment.

The log on variables is taken to reduce fluctuations in a data. The Error term (μ) represents all other factors which are excluded from the model.

It is assumed that the error term is normally and independently distributed with zero mean and constant variance.

Method of analysis.

The study used time series econometrics techniques that are ADF test for checking stationarity of data, Johansen Co-integration test and Error Correction Model.

Unit Root Test.

The first step in dealing with the time series data is to check the presence and solving for the problem of non-stationary. By Non-stationary data, we mean that the mean and variance of the observations are not zero and constant respectively over time so are there any effect of time on data? For this purpose, the Augmented Dickey Fuller (ADF) is applied to check the stationary of the data.

$$\Delta Y = \alpha_0 + \gamma Y_{t-1} + \alpha_{1t} + \sum \beta \Delta Y_{t-1} + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3.1) \qquad \text{ADF test}$$

In this equation, the value of γ represent the test statistic of ADF test. As most of the macroeconomic variables in time series analysis have trend but here the graph of the time series data will decide whether the trend and intercept should be the part of ADF test model or not. According to the graph the trend and intercept are the part of ADF model in this analysis. The null hypothesis is that the variables tested has unit root in this regression and the alternative hypothesis is that there is the stationary (Asterio, 2006).

After getting the result of stationarity through ADF test, it will be checked that if all the variables are stationary at level then simple OLS technique of regression is used. If they are not stationary at level but are stationary at first difference or integrated of the same order, in this case different co-integration techniques like Engel Granger and Johansen co-integration tests are employed. It should be noted that order of the integration should be same for co-integration but if some variables are stationary at level and some are at first difference then long run relationship between variables cannot be analyzed (Asterio, 2006)

As all the variables are stationary at first difference, therefore Johansen Co-Integration test is used for determining the number of co integrating vectors among variables and long run estimates of the model and Error Correction Model is used for short-run analysis.

Johansen Co-Integration Test.

This test involves estimating the following equation.

$$Xt = A0 + \sum_{J=1}^{K} Aj\ X\ i\text{-}j + \varepsilon t \qquad (3.2)$$

The extended form of equation (3.2) is:

$$Xt = A0 + A1Xt\text{-}1 + A2Xt - 2 + \text{----------} + AkXt - k + \varepsilon t \text{----------} (3.3)$$

Error Correction Model (ECM).

ECM for this study were specifies as:

$$\Delta LnGDP = \beta_0 + \beta_1 \Delta Ln\ POP + \beta_2 \Delta Ln\ REM + \beta_3 \Delta Ln\ HCE + \beta_4 \Delta LnFDI - \pi et\text{-}1 + \mu \text{------} (3.4)$$

In the above ECM model, β_1, β_2,β_3 and β_4 shows the immediate impact on dependent variable LnGDP if there is a unit change in the independent variables that are POP, REM, HCE and FDI. But π shows the speed of adjustment towards the long run equilibrium. It shows that how much of equilibrium is being corrected during the period (Asterio, 2006).

Result and Discussions.

The table (1) shows the result of ADF test used for checking the problem of unit root.

Table 1: ADF Unit Root Test.

Variables	**ADF Test Value**	**Critical Value 5% Level of Significance**	**Level of Integration**
LnGDP	-5.784253	-3.552973	I (1)
LnPOP	-4.089334	-3.562882	I (1)
LnREM	-5.096686	-3.552973	I (1)
LnHCE	-5.734127	-3.552973	I (1)
LnFDI	-4.747281	-3.552973	I (1)

The above table shows that all the variables are stationary at 1st difference with log. The order of integration is same that is I (1).

The study also used the Information Criteria to choose the leg length of VAR model. Results with VAR lag order selection criteria are shown below.

Table 2: VAR Lag Order Selection Criteria with 2 Lags.

Lag	**LOGL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	41.73396	NA	7.43e-08	-2.226301	-1.999557	-2.150008
1	319.8566	455.1098	1.65e-14	-17.56707	-16.20660	-17.10931
2	385.5279	87.56173*	1.57e-15*	-20.03199*	-17.53781*	-19.19278*

* indicates lag order selected by the criterion.

LR: sequential modified LR test statistic (each test at 5% level).

FPE: Final prediction error.

AIC: Akaike information criterion.

SC: Schwarz information criterion.

HQ: Hannan-Quinn information criterion.

The table 2 shows that the values of LR, FPE, AIC, SC, and HQ are minimum at lag two; therefore, in this research study has the lag order of two.

This study adopted VAR model of assumption No 5 based on Akaike Information Criteria (AIC).

Table 3: Unrestricted Co-Integration Rank Test (Trace Statistic).

Hypothesized No. of CE(s)	**Eigen Value**	**Trace Statistic**	**0.05 Critical Value**	**Prob****
None *	0.878880	152.3053	88.80380	0.0000
At most 1 *	0.672855	84.75404	63.87610	0.0003
At most 2 *	0.539418	48.99881	42.91525	0.0110
At most 3	0.357819	24.19036	25.87211	0.0798
At most 4	0.268796	10.01802	12.51798	0.1264

Table 4: Unrestricted Co-integration Rank Test (Maximum Eigen Value).

Hypothesized No. of CE(s)	Eigen Value	Max-Eigen Statistic	0.05 Critical Value	Prob**
None *	0.878880	67.55126	38.33101	0.0000
At most 1 *	0.672855	35.75523	32.11832	0.0171
At most 2	0.539418	24.80845	25.82321	0.0676
At most 3	0.357819	14.17234	19.38704	0.2428
At most 4	0.268796	10.01802	12.51798	0.1264

Trace test (table 3) shows that there are three co integrating relationship and maximum Eigen value test (table 4) indicates that there exists two co-integrating relationship among variables at the 0.05 level. It confirms the existence of long run relationships among the variables.

* denotes rejection of the hypothesis at 0.05 level.

** MacKinnon-Haug-Michelis (1999) p-values.

Long Run Estimates of the Model.

Johansen Co-Integration test calculated the long run coefficient estimates of the explanatory variables, which are given in the table (5) and equation where the dependent variable is LnGDP.

Table 5: Johansen Co-Integration test.

Variables	Coefficients	Standard Errors	T-Values
LnPOP	6.706456	0.57043	11.7569
LnREM	0.202270	0.01762	11.4764
LnHCE	1.552924	0.08619	18.0165
LnFDI	-0.080994	0.01040	-7.79103
@TREND(81)	-0.240502	0.01784	-13.4844

LnGDP = -137.1010 + 6.706456 LnPOP + 0.202270 LnREM + 1.552924 LnHCE +

-0.080994 LnFDI - 0.240502 @TREND (81).

The equation shows that Population, Remittances and Household Consumption Expenditures have positive and Foreign Direct Investment have negative and significant effect on Economic Development (LnGDP).

The equation shows that the coefficient of log of the Population is 6.706456, it means that a one percent increase in population will leads to increase the GDP by 6.706456 percent. The one percent increase in Remittances of Pakistan leads to an increase in Real GDP by 0.202270 percent. Similarly, a one percent increase in Household Consumption Expenditures leads to increase GDP by 1.552924 percent and Foreign Direct Investment bring 0.080994 percent decrease in GDP of Pakistan.

Error Correction Model.

Following are the short run estimates of this study.

Table 6: Error Correction Coefficients.

Variables	Coefficient	Standard error	T-ratio
e_{t-1}	-0.380379	0.37393	-1.01725
D (LNPOP(-1))	-5.809850	38.1960	-0.15211
D (LNPOP(-2))	45.43319	33.2420	1.36674
D (LNHCE(-1))	1.267661	0.76143	1.66484
D (LNHCE(-2))	1.557884	0.60889	2.55858
D (LNREM(-1))	0.042238	0.08803	0.47984
D (LNREM(-2))	0.061253	0.09437	0.64908
D (LNFDI(-1))	-0.030599	0.02946	-1.03881
D (LNFDI(-2))	-0.038436	0.03041	-1.26380
C	-1.111170	0.83364	-1.33291

Table 6 shows the Error Correction Coefficients, where the two variables that are Household Consumption Expenditures and HCE have positive effects on GDP in the short run and Population and FDI have negative association with GDP in the short run. All the results are statistically insignificant because the T-Ratios are less than two. The error correction coefficient is -0.380379 and insignificant which confirm that there is no short run disequilibrium.

CONCLUSIONS.

The present study investigated the role of population in Economic Development of Pakistan. For development a proxy variable of GDP is used. The study used ADF test to check the stationarity problem and found that all the variables are stationary at first difference.

To estimate the long run term relationship, the study opted Johansen co-integration test which show that population, remittances and household consumption expenditures have positive and foreign direct investment have negative and significant effect on economic development. It is found that there is a positive and significant effect of Population on GDP of Pakistan and proved that Pakistan not overpopulated.

BIBLIOGRAPHIC REFERENCES.

1. Afzal, M. (2009). Population Growth and Economic Development in Pakistan. Journal The Open Demography , 1-7.

2. Afzal, M., & Farah, R. (2011). Financial Factors in Capital Structure Decisions: Panel Data Analysis of Pakistan's Major Manufacturing Sectors. Interdisciplinary Journal of Contemporary Research in Business , 310-326.

3. Ahmad, A. (2002). Population growth and Development. Retrieved 04 01, 2017, from: Sachet.org.pk/home/esources/material/research_population_02.ASP

4. Allen, C. K. (1988). Population Pressures, Saving, and Investment in the Third World. Economic Development and Cultural Change , 449-464.

5. Asterio, D. (2006). Applied Econometrics,A Modern Approach using Eviews and Microfit. Palgrave Macmillan.

6. Atanda, A. A., Aminu, S. B., & Alimi, O. Y. (2012). The Role of Population on Economic Growth and Development: Evidence from Developing Countries. Nigeria: Datatric Research Consulting.

7. Bloom, D. E., & Canning, D. F. (2011). Implications of population aging for economic growth. PGDA working paper no. 64.

8. Dawson, D. J., & Tiffin, R. (1998). Is there a long-run relationship between population growth and living standard? The case of India. Journal of Development Studies , 149–156.

9. Easterlin, R. (1967). Effects of population growth on the economic development of developing countries. The ANNALS of the American Academy of Political and Social Science , 98-108.

10. GOP. (2012). Economic Survey of Pakistan. Islamabad: Ministry of Finance.

11. Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control , 231-254.

12. Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. Econometrica , 1551-1580.

13. Khan, T., & Yousaf, F. (2013). Unemployment duration of First time job seekers: A Case Study of Bahawalpur. Asian Journal of Economic Modelling , 8-19.

14. Kinugasa, T. (2004). Life Expectancy, Labor Force, and Saving. Ph.D. Dissertation. University of Hawaii at Manoa.

15. Linden, J. (2011). Effects of population growth on economic growth in Asian developing countries. Mälardalen University Västerås.

16. Malthus, T. (1798). An Essay on the Principle of Population. London: Printed for J. Johnson, in St. Paul's Church-Yard.

17. Manan, N., Safdar, S., & Javed, M. (2013). Socio-Economic Determinates of Population Growth. Journal of Economics.

18. Mason, A. (2001). Population Change and Economic Development. Stanford: Stanford University Press.

19. Mushtaq, K. (2006). Population Growth and Economic Development. The Lahore Journal of Economics , 71-77.

20. Rafiq, M. (2008). Determinants of unemployment: A case study of pakistan economy (1998 - 2008). Abasyn Journal of Social Science , 580 - 600.

21. Rosen, J. E., & Rafi, S. (1995). Pakistan's population program: the challenges ahead.

22. Sadik, N. (1997). Social Change _ The Essence of Development,. Pakistan Development Review , 315-320.

23. Savas, B. (2008). The Relationship between Population and Economic Growth: Empirical Evidence from the Central Asian Economies. OAKA, 161-183.

24. Summer, J. (2002). Population and Globalization. Southeast Asian Studies. Journal of Social Science, 1-28.

25. Tang, W., & Zhang, C.-H. (2007). Empirical Bayes methods for controlling the false discovery rate with dependent data. Lecture Notes--Monograph Series.

26. Thomas, Alun, Jordi, & Medina, L. (2010). Current account estimates for emerging market economies. IMF working paper No. 10/43.

27. Trang, P. T., & Hieu, T. H. (2011). Effects of Popu lation Growth on Economic Growth in Asian Developing Countries. Malardalen University.

28. Woodruff, R. B. (1997). Customer value: The next source for competitive advantage. Journal of the Academy of Marketing Science, 139-153.

DATA OF THE AUTHORS.

1. Irfan Ullah Khan. Lecturer, Department of Economics, Government Post Graduate College Bannu KPK, Pakistan. Email: irfan.economics@gmail.com

2. Muhammad Shahzad Iqbal. Assistant Professor. School of Management Studies, The University of Faisalabad, Corresponding Author. Email: shahzad.iqbal@tuf.edu.pk

3. Khalid Mahmood Mughal. Associate Professor, Department of Economics, Preston University, Islamabad Campus, Pakistan. Email: drkhalid0@gmail.com

RECIBIDO: 6 de mayo del 2019. **APROBADO:** 19 de mayo del 2019.