THE IMPACT OF DEMOGRAPHIC TRENDS ON ECONOMIC GROWTH / PRODUCTIVITY IN PAKISTAN (1980 - 2007)

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ABSTRACT

This paper seeks to examine the impact of demographic variables on economic growth in Pakistan. A long-run relationship between the variables has been found by applying Johanson's Co-integration Technique after finding the series I(1). The Error Correction Model (ECM) has been applied to streamline the short-run and long-run impacts of the variables on economic growth. Population has a positive but decreasing impact on economic growth in the long run. Trade liberalisation and Human Capital Formation have a negative impact on globalisation in the long run and an insignificant impact in the short run. As a result of an increase in unemployment in the labour market in the short run, Life Expectancy, Labour Productivity Per Capita and Population Growth Rate have a negative impact on economic growth. This analysis will help decision makers in developing strategies and policies to accelerate economic growth, human capital formation and trade liberalisation in Pakistan.

Keywords: Population Growth Rate; Economic Growth; Labour Force Participation Rate; Trade Openness, Co-integration, Impulse Response Function

INTRODUCTION

In 2007, Pakistan has an estimated population of over 169 million inhabitants and between 1951 and 1998, the urban population in Pakistan expanded sevenfold. By the next decade, the population is expected to exceed 176 million. In the past, the country's population has had a relatively high growth rate that has, however, been moderated by declining fertility and birth rates. Dramatic social changes have led to rapid urbanization and the emergence of mega cities. From 1990 to 2003, Pakistan sustained its historical lead as the most urbanized nation in South Asia, with city dwellers making up 34% of its population (Economic Survey of Pakistan, 2008).

The striking feature of the literature on economic growth is the generally superficial attention it pays to the influence of demographic factors on economic growth. The standard approach acknowledges the possibility that rapid population growth might impede economic growth by including the rate of population growth among the list of variables used to explain the cross-country differences in income growth. However, more often than not, population growth is not significantly associated with the pace of economic growth, thereby supporting the conclusion of population neutralism (Bloom and Freeman 1986) that has held sway for nearly two decades (Kelley and Schmidt 1995).

In recent years, investigators have revisited the connection between population and economic growth, emphasising demographic transition as the process underlying population growth in most developing countries (Bloom and Canning 1999; Bloom and Freeman 1986; Bloom and Sachs 1998; Bloom and Williamson 1997). A demographic transition is a change from a situation of high fertility and high mortality to one of low fertility and low mortality. Bloom and Canning (1999) opines that high rates of population growth are temporary consequences of a decline in mortality rates which precedes a decline in fertility. Less widely recognised though perhaps more important, this situation also suggests sizable changes in the age distribution of the population.

Unlike working individuals whose contribution to output and savings tends to commensurate more with their consumption (Higgins 1998; Higgins and Williamson 1997; Kelley and Schmidt 1996; Lee, Mason, and Miller 1998; Leff 1969; Mason 1988; Webb and Zia 1990), the young and the old consume more output than they generate, As a result, the output per capita — the most widely used indicator of economic performance — tends to be boosted when the population of working-age individuals is relatively large, and to be depressed when a large part of the population consists of young and elderly dependents (Hanushek 1992; Knodel and Wongsith 1991; Knodel, Havanon, and Sittitrai 1990; Rosenzweig 1990).

Recent studies on the effects of population change on economic growth have two key features in common with another study: Coale and Hoover's seminal book, *Population Growth and Economic Development in Low-Income Countries* (1958) that was published more than 40 years ago. Firstly, these works highlight and exploit the fundamental insight that reducing the current rate of population growth does not lead to a corresponding reduction in the current growth rate of the labour force. Secondly, they view that links between population and income move in one direction, that is, from the former to the latter.

A finding from the recent economic development literature concerns the positive effects of good health, as measured by life expectancy, on economic growth. Presumably, this finding reflects the greater incentives that people with longer life expectancy have to save for old age (Mason 1988); increased returns on investments in human capital which are associated with having longer periods over which to recoup those returns (Meltzer 1995); higher productivity, and lower rates of absenteeism. Another potential influence on the pace of economic growth is population density. If natural resources, such as agricultural land, are fixed, increases in the population density are likely to depress the per capita income (Ehrlich 1968). In contrast, opportunities for specialisation and scale economies can cause an increased population density to result in a higher per capita income (Boserup 1981; Kuznets 1967; Simon 1981). Bloom and Sachs (1998) and Gallup (1998) also argue that coastal regions can enjoy greater benefits of specialisation through trade.

Pakistan's economic performance during the last three decades has been impressive with the real GNP growing at an average rate of six per cent per annum. However, the savings rate has shown an almost horizontal trend over the years (State Bank of Pakistan Report, 2006). A number of studies have found a strong inverse relationship between the dependency ratio and the savings rate in the country (Ahmed and Asghar 2004; Khan and Nasir 1999; Burney and Khan 1992; Siddique and Siddique 1993; Khan, Hasan, and Malik 1992). In her study, Nayyab (2006) examines the demographic dividends available to Pakistan through three mechanisms: labour supply, savings, and human capital. She suggests that there is a need for policies on education and public health, and policies that promote labour market flexibility and provide incentives for investment and savings.

After the above cited literature is reviewed, it is clear that there is a need to examine the inter-relationship between demographic variables and economic growth in Pakistan. Population growth rate, life expectancy, human capital formation and the per capita output of workers play significant roles in expanding economic growth, as have been shown in the different studies. The study intends to examine these in the social context of Pakistan.

The following describes the structure of the paper. Section 2 reviews the demographic trend in Pakistan during a rapid globalisation period (1980 to 2007). Section 3 describes the objectives of the study. Section 4 shows the methodology and data. Section 5 reveals the empirical results. The conclusion is in the final section.

DEMOGRAPHIC TREND IN PAKISTAN (1980-2007)

The Pakistani government has instituted substantial economic reforms since 2000. Medium-term prospects for job creation and poverty reduction have been the best in nearly a decade. Government revenues have greatly increased in recent years, as a result of economic growth, the privatization of public utilities and telecommunications and tax reforms -- a broadening of the tax base; more efficient tax collection as a result of self-assessments and corruption controls in the Central Board of Revenue. Pakistan is aggressively cutting tariffs and promoting exports by improving ports, roads, electricity supplies and irrigation projects.

Steady progress has been made in most of the Millennium Development Goals (MDGs) in Pakistan since 2000. A low starting point and slow progress during the 1990s mean that many of the MDG targets will be difficult to reach. The Pakistan Government remains committed to achieving these targets but significant additional resources and effort will be needed to obtain the substantial progress required.

The proportion of the population living below the national poverty line decreased from 34.5 per cent in 2001 to 22.3 per cent in 2005-06. Real GDP growth averaged 6 per cent during this period; consumption inequality increased from 0.31 to 0.33. Enrolment rates in primary schools have increased recently. There are now three million more children in primary schools when compared to 2001. In 2005-06, 53 per cent of 5-9 year-olds were in primary school, up from 42 per cent in 2001. Poor quality of education with poor educational attainments remains a key impediment to progress. The ratio of female to male enrolment rates in primary schools increased from under 0.68 in 1991 to 0.85 in 2005-06.

Progress has been made towards the target of reducing the under-five mortality rates by two thirds. The rate of change will need to be accelerated to meet the target. These rates are still high when compared to those of the rest of South Asia. Mortality among the under-fives

in 2005 was 99 per 1 000 live births compared to 130 in 1990. Pakistan has the sixth highest rate of maternal deaths, that is, around 300-400 deaths per 100,000 births. Pakistan also has the sixth highest number of TB cases in the world although the Daily Observed Treatments (DOTS) case detection and cure rates have improved significantly since 2000, and are on track to meet WHO targets for 2010. Despite a small decline in the number of people with access to safe water over recent years, Pakistan still hopes to halve this number without access to improved water and sanitation by 2015.

Pakistan has a multi-cultural and multi-ethnic society. The infant mortality rate is 68.84 deaths per 1 000 live births. In 2006-7, it was reported that the life expectancy of males is 62.4 while that of females is 64.44 years. The total fertility decline rate is 1.8 children per woman per decade which is the second fastest rate in the world. Literacy is defined as the ability of those over the age of 15 who can read and write. The literacy rates are 60 per cent for males and 42 per cent for females in 2006. There are 157 primary schools, 30 419 middle schools, 17 231secondary schools, 1174 arts and science colleges, 408 professional colleges, and 52 universities in 2006-07 (DFID, 2007).

Although Pakistan has made considerable improvements in various demographic variables in different phases, this growth is not uniform. This implies that opportunities had emerged during the globalisation and reform era but the performance of different growth variables was not up to expectations.

OBJECTIVES OF THE STUDY

The main objectives of the study are

- To analyse the progressive changes in the demographic indicators of Pakistan
- To critically examine the demographic impact on the economic growth of Pakistan during the period of 1980-2007
- To establish a long-run relationship between the variables

DATA SOURCE AND METHODOLOGICAL FRAMEWORK

The data were taken from the IFS (International Financial Statistics), the WDI (World Development Indicators) and the Economic Survey of Pakistan (various issues) for the period 1980-2007. All variables are in natural logarithm form and are in million Pakistan rupees (PKR). The GDP ratios of all these variables were taken for estimation purposes. An indicator that has received scant attention from economic theorists is the degree of openness (Harrison 1996). For trade openness of an economy, we use (Import + Export) as a share of GDP. HCAP indicates human capital with a percentage share of primary school-going population. Population (POP) changes might have different impacts on economic growth (GDP); progression is modified, and whether or not these changes take place in the framework of macroeconomic stabilisation policies.

In this research, a recent technique, the Johansen's co-integration technique, is employed to find a long-run relationship between the variables. The following model is estimated:

$$DLn(GDP) = \alpha_O DLn(LABOUR) + \alpha_1 DLn(HCAP) + \alpha_2 DLn(TOP) + \alpha_3 DLn(POP) + \alpha_4 DLn(LIFE) + \alpha_5 Ln(GDP(-1)) + \alpha_6 Ln(LABOUR(-1)) + \alpha_7 Ln(HCAP(-1)) + \alpha_8 Ln(TOP(-1)) + \alpha_9 Ln(POP(-1)) + \alpha_{10} Ln(LIFE(-1)) + \varepsilon ...(1)$$

Abbreviations:

Ln	= Natural Logarithm
GDP	= Gross Domestic Product (PKR in millions)
LABOUR	= Number of Workers Per Capita (PKR in millions)
TOP	= Trade Openness (Trade to GDP ratio)
HCAP	= Human Capital (percentage share of primary school-going population)
POP	= Population Growth in millions
LIFE	= Life Expectancy that serves as a proxy for the health status of the population
ε	= Error Correction Term
D	= First Difference

The following steps will be taken to investigate the impact of the independent variables on the GDP. In testing time-series properties and co-integration evidence, the preliminary step in analysis is to establish the degree of integration of each variable. The steps to find if the levels of differences of a series are stationary lead to substantially different conclusions. Hence, tests of non-stationarity (that is, unit roots) are the usual practice today. Engle-Granger (1987) define a non-stationary time series to an integrated of order'd' if it becomes stationary after being differentiated'd' time. This notion is normally denoted by I(d).

The test for co-integration consists of two steps: first, the individual series are tested for a common order of integration. If the series are integrated and are of the same order, it implies co-integration. The Augmented Dickey Fuller (ADF) test is used to test the stationarity of the series. The ADF test is a standard unit root test: it analyzes the order of integration of the data series. These statistics are calculated with a constant, and a constant plus time trend, and these tests have a null hypothesis of non-stationarity against an alternative of stationarity. The ADF test to check the stationarity series is based on the following equation:

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_i \sum_{t=1}^{m} \Delta y_{t-1} + \varepsilon_t ...(2)$$

where ε_t is a pure white noise error term and

$$\Delta y_{t-1} = (y_{t-1} - y_{t-2}),\ \Delta y_{t-2} = (y_{t-2} - y_{t-3}),\ \text{etc.}$$

It is an empirical fact that many macroeconomic variables appear to be integrated of order 'd' [or I(d) in the terminology of Engle and Granger (1987)] so that their changes are stationary. Hence, if GDP, TOP, HCAP, POP, LIFE, LABOUR are each I(d), then it may be true that any linear combination of these variables will also be I(d). When it is established that all of these variables are I(d), this study then proceeds to determine the

order of integration of the series for the analysis of the long-run relationships between the dependent variables. To examine the long-run relationship among the variables, they must be co-integrated. Two or more variables are said to be co-integrated if their linear combination is integrated to any order less than 'd'. The co-integration test provides the basis for tracing the long-run relationship. Two tests for co-integration have been given in the literature review (Engle and Granger 1987; Johansen and Juselius 1990). In the multivariate case, if the I(1) variables are linked by more than one co-integrating vector, the Engle-Granger procedure is not applicable. The test for co-integration used here is the likelihood ratio put forward by Johansen and Juselius (1990), indicating that the maximum likelihood method is more appropriate in a multivariate system. Therefore, this method is used in this study to identify the number of co-integrated vectors in the model.

The Johansen and Juselius method has been developed in part by the literature available in the field and reduced rank regression, and the co-integrating vector 'r' is defined by Johansen as the maximum Eigen-value and trace test. There are 'r' or more co-integrating vectors. Johansen and Juselius (1990) and Johansen (1991) propose that the multivariate co-integration methodology can be defined as:

$\text{Ln}(\text{GDP}_{t)} = \text{Ln}(\text{LABOUR, TOP, HCAP, POP, LIFE})\ldots(3)$

which is a vector of $P = 5$ elements. Considering the following autoregressive representation:

$$GDP_t = \pi_\circ + \sum_{T=1}^{K} \pi_i GDP_{t-1} + \mu_t$$

Johansen's method involves the estimation of the above equation by the maximum likelihood technique, and the testing of the hypothesis H_o; $(\pi = \Psi\xi)$ of 'r' co-integrating relationships, where 'r' is the rank or the matrix $\pi(0 \angle r \angle \text{P}), \Psi$ is the matrix of weights with which the variable enters co-integrating relationships and ξ is the matrix of co-integrating vectors. The null hypothesis of non-cointegration among variables is rejected when the estimated likelihood test statistic $\phi_i \{= -n \sum_{t=r+1}^{p} \ln(1 - \hat{\lambda}_i\}$ exceeds its critical value. Given estimates of the Eigen-value $(\hat{\lambda}_i)$ the Eigen-vector (ξ_i) and the weights (Ψ_i), we can find out whether or not the variables in the vector (GDP_t) are co-integrated in one or more long-run relationships among the dependent variables.

If the time series are I(1), then one could run regressions in their first differences. However, when we take first differences, we lose the long-run relationship that is stored in the data. This implies that one needs to use variables in levels as well. The advantage of the Error Correction Model (ECM) is that it incorporates variables both in their levels and first differences. In doing this, ECM captures the short-run disequilibrium situations as well as the long run equilibrium adjustments between the variables. An ECM term having a negative(-) sign and a value between 0 and 1 indicates a convergence of the model towards a long-run equilibrium and shows how much percentage adjustment takes place every year.

EMPIRICAL ANALYSIS

Since the present study is an attempt to identify the links between the economic growth and demographic variables of Pakistan, we estimate whether a statistically significant relationship exists between some measures of trade liberalisation and economic growth levels in the long run as well as in the short run. The preliminary step in this analysis is to establish the degree of integration of each variable. To get reliable results for equation 1, the implicit assumption is that the variables in equation 1 are I(1) and co-integrated. We test for the existence of a unit root in the level and the first difference of each variable in our sample using the Augmented Dickey Fuller (ADF) test. The ADF test statistics check the stationarity of series. The results in Table 1 reveal that all other variables are non-stationary in their level data. However, stationarity is found in the first differencing level of the variables: Economic Growth, Number of Workers Per Capita, Human Capital, Trade Openness, Population Growth Rate and Life Expectancy.

Table 1. Unit Root Estimation

	Level		First Difference	
Variables	Constant	Constant and Trend	Constant	Constant and Trend
GDP	0.468	-1.315	-5.028*	-5.414*
LABOUR	0.721	-0.558	-4.596*	-5.418*
TOP	-1.749	-1.646	-4.911*	-4.892*
HCAP	0.701	-2.337	-2.968**	-3.331*
POP	1.502	-1.386	-3.603**	-8.001*
LIFE	-1.087	-2.077	-3.802*	-3.761**

Note: * significant at 1%; ** significant at 5% level

Next we examine the relationship between the GDP and the independent variables using the Multivariate Co-integration Methodology proposed by Johanson & Juselius (1990) and Joahnsen (1991). The Johanson maximum likelihood approach has some advantages over the traditional Engle-Granger procedure: (i) it allows testing in a multivariate framework (ii) it considers the error structure of the data processors (iii) it allows for interactions in the determination of the relevant economic variables, independent of the choice of the endogenous variables and (iv) it allows explicit hypothesis tests of parameter estimates and rank restrictions, using the likelihood ratio tests that employ Chi-square statistics. The Johanson's Co-integration Test indicates at least one co-integrating vector. Thus, long-run relationships are supported by the data-generating process. When the Johanson and Juselius (1990) multivariate co-integration tests are used, it is found that a statistically significant relationship exists between the independent variables on economic growth (GDP). The following co-integrating vectors have been determined using the above test.

Table 2. Johansen's Test for Multiple Co-integration; Vectors Co-integration Tests among GDP, LABOUR, HCAP, TOP, POP, LIFE

H0:	H1:	Test Statistics	0.05 Critical Values	Prob. **
λ trace		Λ trace		
$r = 0^*$	$r > 0$	177.59	95.75	0.0000
$r \leq 1^*$	$r > 1$	122.41	69.81	0.0000
$r \leq 2^*$	$r > 2$	73.04	47.85	0.0000
$r \leq 3^*$	$r > 3$	36.26	29.79	0.0078
$r \leq 4$	$r > 4$	8.961	15.49	0.0368
$r \leq 5$	$r > 5$	$352E-05$	3.841	0.9972

Note: Trace test indicates 4 co-integrating equations at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) p-values

Λ max Values		λ max Values		
$r = 0^*$	$r > 0$	55.81	40.07	0.0005
$r \leq 1^*$	$r > 1$	49.36	33.87	0.0004
$r \leq 2^*$	$r > 2$	36.78	27.58	0.0025
$r \leq 3^*$	$r > 3$	27.30	21.13	0.0059
$r \leq 4$	$r > 4$	8.96	14.26	0.2894
$r \leq 5$	$r > 5$	$3.52E-05$	3.841	0.9972

Note: Max-Eigen Value test indicates 4 co-integrating equations at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
** MacKinnon-Haug-Michelis (1999) p-values

Co-integrating Vector	GDP	LABOUR	TOP	HCAP	POP	LIFE
(Standard error in parentheses)	-1	1.314	-0.811	-8.192	2.506	-6.424
		(0.439)	(-0.0369)	(-0.7399)	(0.384)	(-1.490)

This study starts with the null hypothesis of no co-integration *(r=0)* among the variables. It is found that the trace statistic of 177.59 exceeds the 95 per cent critical value (95.75) of the λ trace statistic. It is possible to reject the null hypothesis *(r=0)* of no co-integration vector in favour of the general alternative $r \geq 1$. As evident in Table 2, the null hypotheses of $r \leq 1, r \leq 2, r < 3$ are also rejected at 5 per cent level of significance. The null hypotheses

of $r \leq 4, r \leq 5$ cannot be rejected at 5 per cent level of confidence. Consequently, we conclude that there are 4 co-integration relationships involving the variables GDP, LABOUR, TOP, HCAP, POP and LIFE.

In contrast, λ max statistic rejects the null hypothesis of no co-integration vector *(r=0)* against the alternative *(r=1)* as the calculated value λ max (0, 1) = 55.81 exceeds the 95 per cent critical value (40.07). Thus, on the basis of λ max statistic, there are 4 co-integration vectors. The presence of the co-integration vectors shows that there exists a long-run relationship among the variables. The co-integrating equation is displayed in the last column, showing that the long-run elasticities of LABOUR, TOP, HCAP, POP and LIFE are 1.314 per cent, -0.811 per cent, -8.192 per cent, 2.506 per cent and -6.424 per cent respectively. In order to check the stability of the long-run relationship between the GDP and the independent variables, we assess the Error Correction Model.

Table 3. Empirical Results of the Error Correction Model
Dependent Variable: D (GDP)

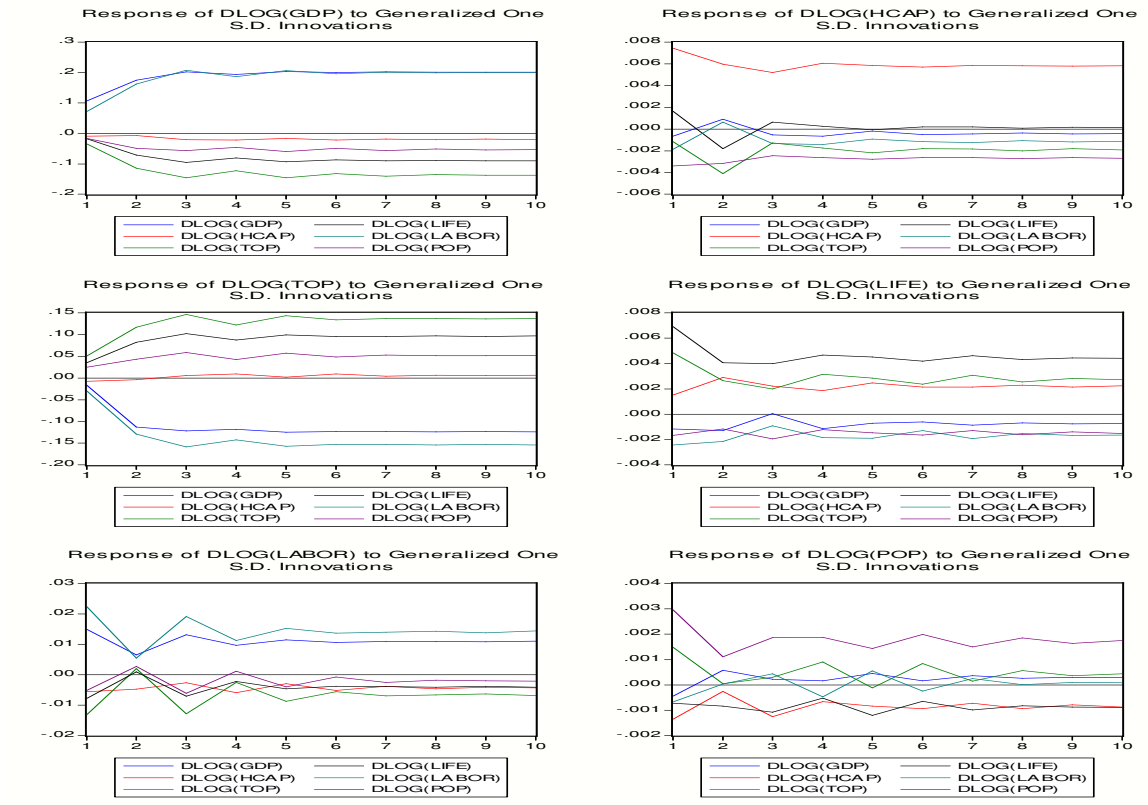
Independent Variables	Short-run Elasticities	Long-run Elasticities
C	-45.085	----------
LABOUR	-9.844**	2.345
TOP	-1.065	-4.321*
HCAP	8.742	-14.036*
POP	-0.539*	21.64*
LIFE	-0.659***	14.79
ECM	-0.13	
R Square	0.917	
Adjusted R Square	0.818	
F Statistics	9.351*	
Inverted MA Roots	1.00	

* denotes rejection of the hypothesis at 1%, ** at 5% and *** at 10% significance level, hence denoting significance

The ECM results indicate that the ECM term has a negative sign and its value lies between 0 and 1, hence showing the convergence of the model and implying that about 13% adjustment takes place every year. Table 3 indicates that LABOUR, POP and LIFE are significant in the short run while TOP, HCAP and POP elasticities are significant in the long run. The empirical evidence shows that the labour productivity per capita has a negative impact on the GDP owing to increased unemployment in the labour force market. Similarly, population growth rate and life expectancy also have negative effects on economic growth which indicates serious concerns about the health of the labour force. In the long run, human capital and trade openness have a significant negative impact on economic growth because of the overall globalisation that has affected the Pakistan economy. Other results indicate that Pakistan has a low level of human capital. Therefore, the effect on growth becomes negative. Labour productivity per capita is reported as insignificant in the long run which may indicate post persistent effects of negative growth in the job market.

Detecting Granger causality is restricted to within sample tests which are useful in describing the plausible Granger exogenity or endogenity of the dependent variable in the sample period but are unable to deduce the degree of exogenity of the variables beyond the sample period. To examine this issue, we consider the generalised impulse response functions. Figure 2 presents the impulse response functions. The figures plot the response of the GDP to shocks in Labour Productivity Per Capita, Human Capital Formation, Trade Openness, Life Expectancy and Population Growth Rate.

Figure 2. Impulse Response of GDP to One-standard Deviation Shocks in HCAP, TOP, LIFE, LABOUR and POP



A shock in the GDP has a negative and decreasing effect on human capital, trade openness, life expectancy and population growth rates at the very beginning but a positive effect on labour productivity per capita over a 10-year period (refer to Table 4a in the Appendix).

A shock to labour productivity per capita has a positive effect on the GDP but a subsequent negative effect on human capital formation, life expectancy and trade openness in the beginning year (refer to Table 4b in the Appendix).

Population has a positive and decreasing effect on economic growth over the 10-year period but a negative effect on human capital formation and life expectancy of the

population. Table 4c (in the Appendix) shows a change in population over a 10-year period. Similarly, life expectancy has a negative effect on the GDP and population growth rates while trade openness has a negative effect on the GDP and labour productivity per capita over a period of 10 years. These are shown in Tables 4d and 4e respectively.

The present study reviews the impact of demographic trends on economic growth/ productivity in Pakistan over a period of 28 years from 1980 to 2007. The results reveal that there is a long-run relationship between demographic variables and economic growth when the Johansen Co-integration Technique is applied. Studies conducted by Bloom and Freeman (1986) and Kelly and Schmidt (1995) have advocated population neutralism. One reason for the difference in results is the use of different research techniques in both papers. Another reason is that in individual country assessments, country shocks are absorbed and data are refined accordingly. In a collective study on ASEAN, these individual country shocks cannot be accounted for.

A study conducted by Mason (1988) on the healthcare status of the labour force shows that life expectancy has a positive impact on economic growth. In this study, life expectancy along with labour productivity has a negative impact on economic growth. This negative growth is due to low healthcare expenditures (less than 2 per cent of the GDP) in comparison to a higher population growth rate.

CONCLUSION

The paper attempts to investigate the demographic impact on the GDP growth of Pakistan from 1980 to 2007. This study establishes strong links between demographic changes and economic growth. The results reveal that economic growth is dependent on different variables. The variables used in this study are Increase in Life Expectancy, Population Growth Rate, Human and Capital formation. However, Labour Force Per Capita has a negative impact on economic growth in the short run, and an insignificant effect in the long run.

It is evident from the implications that overall globalisation has hurt the Pakistan economy in the long run. Developing countries have to focus on population control by developing their human resources, improving the safety of workplaces, improving the healthcare system and the educational system. Poor health and inadequate educational facilities have contributed towards the low productivity of the labour force in Pakistan. The trade liberalisation model in Pakistan must be viewed in terms of its relevance to human and economic development efforts in Pakistan. Further research can be extended to other demographic variables such as industrial structure, physical infrastructure and real exchange rates.

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