

Internal and External Determinants of Economic Growth: A closer look at Pakistan's Economy

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This study aims to investigate the impact of internal and external determinants of economic growth on the economic growth of Pakistan. Major internal determinants include stock of physical capital and developmental expenditures, while external determinants include trade openness and real effective exchange rate. In doing so, study utilizes the annual time series data from 1972 to 2011. Advanced Autoregressive Distributed Lag model (ARDL) approach has been employed for co-integration and error correction model (ECM) for short-run results. Empirical investigations indicate that developmental expenditures, physical capital and trade openness are positively correlated with economic growth in long run, while real effective exchange rate negatively and significantly affect economic growth in long run in case of Pakistan.

Keywords: Economic growth; trade openness; real effective exchange rate; cointegration; Pakistan

JEL Classifications: C22; O47, Q27

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1. Introduction

In today's economic world the ultimate objective of the policy makers in any economy is the achievement of high and sustainable economic growth. Economic growth can be defined as the increasing capacity of the economy to satisfy the wants of goods and services of the economic agents of society, thereby increasing the living standard of the people of the country (Sentsho 2000). Economic growth causes a reduction in poverty, unemployment, inflation and budget deficit on one hand, and on the other hand it increases income, quality of life, and welfare of the society as a whole (Barro 1996).

In this globalized era, the determinants of economic growth have attracted increasing attention in both theoretical and applied research from the last two decades like Barro (1991), Khatiwada and Sharma (2002), Mullick (2004) etc. After the Second World War, economies are opened up and their performance is subject to not only internal but also the external factors that can effect economic growth directly or indirectly. The determinants of economic growth can be classified as internal determinants and external determinants (Mullick 2004).

Pakistan has remained under different political regimes, with every government having its different economic plan. Some governments targeted internal factors like agricultural sector, nationalization policies and industrial reforms, while other concentrated on external factors like trade agreements and exchange rate management to boost up the economic growth. Due to political instability and inappropriate growth plans, we have not achieved sustainable growth rates (Shahbaz & Ahmed 2008). This study would explore the different internal and external determinants of economic growth that affected our economy by considering domestic and international economic conditions as well as development in growth theory over time. Therefore, our analysis would be theoretical as well as empirical. Theoretical side of our study would enable us to identify

specific factors that can boost up our economy in the light of economic theory, while empirical side would further justify our growth framework developed in theoretical part of our study.

2. A Brief Look on Relevant Literature

Iqbal and Zahid (1998) empirically examine the macroeconomic determinants of economic growth in Pakistan during 1959-1997. The factors effecting economic growth included human capital, stock of physical capital, trade openness, budget deficit, and external debt. Results presented in this study revealed that enrolment in primary education is positively correlated with both dependent variables. Accumulation of physical capital also positively related with economic growth, so author suggested that government must provide physical capital including infrastructure by encouraging the participation of private sector to promote economic growth. Budget deficit found to be negatively related with economic growth therefore it is government must control non-development expenditures. Similarly external debt affecting both growth variables negatively so it is being suggested that expenditures must be financed with available domestic resources.

To estimate the impact of labor force, investment in human capital, stock of physical capital, inflation, trade openness, and technological catch-up on economic growth, Dewan and Hussein (2001) developed an empirical growth model and estimate it by using panel data of 41 developing countries over the period 1965-97. For empirical analysis this study employed production function based on the neoclassical growth model developed by Solow (1956). Results revealed that investment in human capital, domestic investment, Technological progress, and trade openness positively affect economic growth.

Mullick (2004) empirically examined the impact of foreign reserves, aggregate investment, unemployment, stock exchange index, CPI, budgetary debt financing, development expenditures as a

percentage of GDP, expenditures on education as a percentage of GDP, health expenditures as a percentage of GDP, and trade deficit on economic growth of Pakistan. Sample contained annual time series data from 1980 to 2003. Regression results revealed that foreign aid, development expenditures, and expenditures on health and education positively affect economic growth. Author concluded that US aid increased economic growth through its positive impact on infrastructure development which resulted in safe and profitable business environment.

Composition of government expenditures is another important determinant of economic growth. Alam and Butt (2010) empirically examined the impact of social expenditures on economic growth, by considering ten developing countries of Asia including Bangladesh, India, Indonesia, Korea, Malaysia, Pakistan, Philippine, Singapore, Sri Lanka, and Thailand. For analyzing long run impact of social expenditures on economic growth, Co-integration test has been employed. Study based on annual data from 1970 to 2005. Empirical analyses suggested that there exist long run dynamic relationship between social expenditures and economic growth for all countries considered in sample. Based on the analyses study concluded that expenditures in social sector increase economic growth by enhancing productivity, improving infrastructure, and providing better health and education facilities.

To investigate the determinants of economic growth Tolo (2011) used panel data of 23 emerging countries for the period 1965–2008 in Philippines. For empirical analysis a fixed-effects panel regression analysis is employed. Empirical results were found to be consistent with those in growth literature. A higher value of agricultural exports in total exports as well as in total GDP was associated with higher value of economic growth. Fiscal surplus used as the proxy for macroeconomic stability and found to be significant and positively related with economic growth. Investment is considered

as proxy for capital accumulation and positively correlated with GDP growth. The number of patents applied being used as a proxy for research and development was also highly significant and has positive impacts on growth over time. Finally current account and trade balances were found to be negatively correlated with growth rates of GDP.

Pakistan is facing fluctuating growth rates since independence. A lot of research has been conducted to investigate the determinants of economic growth in Pakistan like Khan and Amjad (2004), Khan and Qayyum (2005), and Alam (2010). But growth literature doesn't provide any framework for comparing the relative impact of internal and external determinants of economic growth. This study attempts to disentangle the effects of internal and external determinants on economic growth of Pakistan.

3. Methodology

Generally, to explore the determinants of economic growth, researchers have used neoclassical growth models such as Solow (1956), Cass (1965), and Koopmans (1965). These models considered two supply side factors i.e. labor and capital, as major determinants of economic growth in any country, i.e.

$$Y = f(L, K) \dots \dots \dots (1)$$

Where Y is the growth rate of per capita GDP, L and K stands for labor and capital respectively. The findings of these models suggested that, given the technological level, poor countries tend to grow faster than the rich countries due to diminishing returns, that is there exists convergence in the level of per capita income across countries. However when researchers realized that labor force can never be identical regarding skills and productivity, they introduced the impact of education and human capital development in neoclassical growth models, such as Barro (1991), Iqbal and Zahid

(1998), etc. Among the internal determinants of economic growth, physical infrastructure and institutional framework has extensively debated in growth literature such as Radelet, Sachs and Wha Lee (1997), Loayza and Soto (2002), Kogid *at all* (2010), Alam and Butt (2010) etc., and these studies suggested that developmental expenditures of the Government for the development of infrastructure and institutions enhance economic growth. So, neoclassical growth models were extended to analyze the impact of infrastructure development on economic growth. Other internal determinants of economic growth which remained under the concentration of researchers include budget deficit and financial liberalization such as Bassanini and Scarpetta (2001), Iqbal and Zahid (1998). Mullick (2004) empirically examined the impact of developmental expenditures and budget deficit on economic growth of Pakistan.

A lot of research has been conducted to examine the impact of external factors on economic growth, by employing different estimation techniques. Gupta and Islam (1983) estimated simultaneous equation model by employing ordinary least square (OLS), while Barro (1996) used regression analysis on cross country data to explore the internal and external determinants of economic growth. Bassanini and Scarpetta (2001) started their analysis with neoclassical growth model then introduced other determinants of economic growth by extending basic growth model.

Among the external determinants of economic growth trade liberalization and exchange rate are the two key factors examined by many researchers such as George and Sotiris (2007), Trautwein (2007), Shahbaz (2008) etc.. The results revealed that trade openness promote economic growth, while exchange rate volatility negatively affects economic growth. Foreign remittances also play important role in enhancing economic growth as explained by Falki (2009). Finally impact of foreign direct investment also play vital role in economic

growth of any country. A lot of studies considered FDI as an important determinant of economic growth such as George and Sotiris (2007), Gylfason and Hochreiter (2008) etc.

From the growth literature, we can realize that, although determinants of economic growth have been extensively explored, but there exists a gap in the literature regarding comparative analysis of internal and external determinants of economic growth, especially in case of Pakistan. Now following the literature, we can specify our growth model for both internal and external determinants of economic growth as below:

$$GDP = f(DE, PC, TO, REER)..... (2)$$

Where **GDP** is gross domestic product, **DE** is developmental expenditures of government, **PC** is physical capital (measured by foreign direct investment) **TO** is trade openness and liberalization measures (measured as imports plus exports to GDP ratio), and **REER** is changes in real effective exchange rate.

This study employed the autoregressive distributed lag (ARDL) framework introduced by Pesaran and Shin (1995, 1999), Pesaran, et al. (1996), and Pesaran (1997) to establish the long run relationship between economic growth and its determinants. The ARDL method has many advantages over the other co-integration techniques. The main advantage lies in the fact that there is no need for pre-testing the variables for their order of integration, that is; this methodology avoids the pretesting problems associated with standard co-integration techniques, which requires that variables must be classified according to their order of integration, before applying co-integration technique. So ARDL can be applied regardless of whether the variables are I(1), I(0), or fractionally integrated.

For ARDL representation, we start from our basic model developed in the previous chapter, the equation for ARDL representation of basic model (Eq 3) is formulated as under.

$$\begin{aligned}
\Delta GDP_t = & \alpha_0 + \alpha_1 \Delta DE_{t-1} + \alpha_2 \Delta PC_{t-1} + \alpha_3 \Delta TO_{t-1} + \alpha_4 \Delta REER_{t-1} + \\
& \sum_{i=0}^k \alpha_{5i} \Delta DE_{t-i} + \sum_{i=0}^k \alpha_{6i} \Delta PC_{t-i} + \sum_{i=0}^k \alpha_{7i} \Delta TO_{t-i} + \\
& \sum_{i=0}^k \alpha_{8i} \Delta REER_{t-i} + \sum_{i=0}^k \alpha_{9i} \Delta GDP_{t-i} + \varepsilon_t
\end{aligned} \tag{3}$$

Where Δ is the first difference operator, the coefficients of first differenced variables (shown with summation sign) show short run effects, while long run effects are captured by the first part of the above equation. For the presence of long run relationship, following hypothesis tested by employing bound testing procedure, presented by Pesaran et al (2001).

H_0 : $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ (No long run relationship)

H_1 : $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 \neq 0$ (There exists a long run relationship)

Finally, the associated ARDL error correction models are obtained, while using following short run error correction representation:

$$\begin{aligned}
\Delta GDP_t = & \alpha_0 + \sum_{i=0}^k \alpha_{1i} \Delta DE_{t-i} + \sum_{i=0}^k \alpha_{2i} \Delta PC_{t-i} + \sum_{i=0}^k \alpha_{3i} \Delta TO_{t-i} + \\
& \sum_{i=0}^k \alpha_{4i} \Delta REER_{t-i} + \sum_{i=0}^k \alpha_{5i} \Delta GDP_{t-i} + \gamma ECM_{t-1} + \varepsilon_t
\end{aligned} \tag{4}$$

Error correction model shows the speed of adjustment with which variables converge to long run equilibrium in one year. For the estimation of above equation, we have used annual time series data for all variables over the period of 1972-2011, that has been collected from World Bank's world development indicators, 50 years handbook of statistics on Pakistan economy published by State Bank of Pakistan, and economic survey of Pakistan, published by ministry of Finance Pakistan since 1972.

4. Results

The results obtained from ADF test are summarized in table 1. The test results have shown that the real effective exchange rate (REER) and GDP are non-stationary series (i.e. at level the ADF statistics do not exceed the Mackinnon critical values). However by taking first difference of these variables, they become stationary and considered as **I(1)** variables. But trade openness (TO) and developmental expenditures and physical capital are stationary at level (i.e. ADF statistics is greater than critical values in absolute terms), therefore they are considered as **I(0)** variable.

Table 1

Augmented Dickey-Fuller (ADF) Test on the levels and on the first difference of the variables (1972-2011)

Variables	Level		First difference		Order of integration
	Constant	Constant and trend	Constant	Constant and trend	
TO	-3.641 (-3.610)*	-3.817 (-3.529)**	—	—	I(0)
REER	4.771 (-3.646)*	0.2288 (-3.209)***	-0.7513 (-2.621)***	-6.2857 (-4.26)*	I(1)
DE	-3.308981 (-2.9639)**	—	—	—	I(0)
PC	-2.963 (-3.308)**	—	—	—	I(0)
GDP	2.6024 (-2.607)***	-3.079 (-3.218)***	-3.0034 (-2.941)**	—	I(1)

Note: The null hypothesis is that the series contain a unit root i.e. non stationary. The rejection of null hypothesis is based on MacKinnon (1996) critical values given in brackets. *, **, *** shows that given value is significant at 1%, 5%, and 10% respectively.

The unit root test provides mixed results. Results revealed that trade openness (TO), developmental expenditures and physical capital are stationary at level, while REER is stationary at I(1), so co-integration relationship is not possible under the Johansen co-integration technique. This provides a best rationale for using ARDL co-integration procedure. The computed F-statistics value is given in Table 2.

Table 2

Computed F-test value

F-statistics	Probability
6.0834***	0.001

Above table shows the outcomes of the bounds co-integration test. As the computed Wald F-statistics of 6.0834 is greater than upper

critical bound value of 4.66, so we can conclude that there exists long run relationship among economic growth and explanatory variables. The regression results are reported in Table 3.

Table 3

Regression results

Dependent Variable: DLOG(GDP)			
Method: Least Squares			
Included observations: 38 after adjustments			
Variables	Coefficients	t-statistic	Prob
C	7.629312	1.689090	0.1053
LOG(PC(-1))	6.081386**	-2.866271	0.0090
LOG(DE(-1))	1.215850*	2.579262	0.0171
LOG(GDP(-1))	-0.896308***	-4.891755	0.0001
LOG(REER(-1))	-0.976184*	-1.701156	0.1030
LOG(TO(-1))	-1.381638	-0.948984	0.3529
DLOG(PC)	-0.693580	-0.427836	0.6729
DLOG(DE)	2.641474	2.015299	0.0563
DLOG(REER)	-3.130900	-1.730201	0.0976
DLOG(TO)	0.219760	0.218558	0.8290
DLOG(DE(-1))	1.980506	-1.499715	0.1479
DLOG(TO(-1))	1.226851	1.297964	0.2077
DLOG(REER(-1))	-0.996204	0.773569	0.4474
DLOG(PC(-2))	2.235306*	2.219240	0.0371
DLOG(TO(-2))	1.938398*	2.216169	0.0373
R-squared	0.783694		
Akaike info criterion	1.551243		
Adjusted R-squared	0.707565		
Schwarz criterion	2.068375		
Durbin-Watson stat	1.912693		

Note: *, **, *** shows significance level at 10%, 5% and 1% respectively.

The results indicate that stock of physical capital (PC) is an important internal determinant of economic growth; the coefficient of PC is significant and positive which shows that one percent increase in

PC increase economic growth by 1.93%. Our findings are consistent with economic theory as well as empirical research, as same impact of FDI (proxy for PC) on economic growth is explained by George et al. (2007).

Results indicate that coefficient of developmental expenditures is positive but insignificant in short run, however it become significant in the long run. One percent increase in developmental expenditures may increase economic growth up to 1.98% in the short run. Developmental expenditures on one hand increase stock of human capital which leads to economic growth (Solow 1956), on the other hand increase productivity of labor force by providing better health facilities.

Coefficient of trade openness (TO) is positive and significant in the short run, but become negative and insignificant in the long run. The results indicate that export capacity is not increasing in Pakistan, so trade openness ultimately resulted in high volume of imports. A similar impact of the international trade is explained by Love and Chandra (2005) where no causality was found between international trade and economic growth in case of Pakistan. Trade liberalization is also found to be less beneficial in MENA region and adversely affect economic growth Makdisi et al. (2005).

The long-run impact of physical capital, developmental expenditures, trade openness and real effective exchange rate is summarized in following Table 4.

Table 4

Long run and Short run elasticities

Dependent variable: DLOG(GDP)		
variables	Long Run	Short Run
PC	0.0506	2.235
DE	2.356	1.980
REER	-3.077	-0.996
TO	0.189	1.938

Note: all variables are significant at 10%, except trade openness.

Results reveal that coefficient of stock of physical capital is positive and significant, which shows a direct relationship between physical capital and economic growth in the long run. Our results support economic theory and growth literature as same impact of physical capital and economic growth is presented by Solow (1956), Barrow (1991), etc. the coefficient of 0.056 suggest that 1% change in physical capital stock will increase economic growth by 0.056% in long run. Impact of developmental expenditures is statistically significant and positive on economic growth. Coefficient of 2.356 depicts that if government increases its developmental expenditures by one 1%, it will promote economic growth by 2.356% in long run. The negative and significant coefficient of exchange rate shows that exchange rate fluctuations adversely effected economic growth of Pakistan in long run. Coefficient of -3.077 depicts that if exchange rate increases by 1%, it will decrease economic growth by 3.077%. The negative sign appears with the coefficient of exchange rate due to fact that Pakistan is facing trade deficit for many years, so if currency devaluated (exchange rate increases) it will increase import bill, and cost of

imported raw material. Finally, coefficient of trade openness is positive but its impact on economic growth is quite insignificant. The estimated results of ECM are presented in Table 5.

Table 5

Error Correction Model

Dependent Variable: LOG(GDP) Method: Least Squares Included observations: 37 after adjustments			
variable	Coefficient	t-statistics	probability
LOG(PC(-1))	2.775917*	2.329471	0.0263
LOG(DE(-1))	1.800921***	6.158024	0.0000
LOG(REER(-1))	-2.785668***	-7.259221	0.0000
LOG(TO(-2))	0.656330*	2.047027	0.0489
ECM (-1)	-0.256220***	8.319879	0.0000
R-squared	0.696834		
Mean dependent variable	1.523413		
Adjusted R-squared	0.658938		
S.D. dependent variable	0.497237		

Note: *, **, *** shows significance at 10%, 5%, and 1% respectively.

The coefficient of error correction model (ECM) shows how quickly/slowly variables return to equilibrium. As shown in above table the coefficient of ECM is negative and highly significant. The coefficient of 0.256 implies that any divergence of economic growth from long run equilibrium will be corrected by about 25.6% over the following year. This high level of short run adjustment is due to high significant value of developmental expenditures, along with significant values of all other regressors in short run. Trade liberalization policies and stock of physical capital are also significant helpful in the

convergence of long run economic growth by enhancing economic performance in the short run.

5. Conclusions

This study, by applying ARDL (for the period of 1972 to 2011) has provided long run effects of trade openness, real exchange rate, stock of physical capital, and developmental expenditures on economic growth of Pakistan. Our empirical analysis revealed important results, which can be summarized as follows:

Developmental expenditures positively and significantly affect economic growth in long run. Developmental expenditures positively affect economic growth by promoting communication and transport infrastructure development, developing human capital and promoting quality of labor force by providing health and education facilities. Impact of physical capital is also positive and significant on economic growth both in short run and long run. Stock of physical capital play important role in increasing the productive capacity of the economy by increasing per worker output. Findings revealed that exchange rate negatively and significantly effected economic growth. As explained previously this impact of exchange rate is due to import oriented economy. Negative impact of exchange rate adversely effected our terms of trade and hence trade balance. Finally trade liberalization policies positively affected economic growth but their impact remained quite insignificant in the long run. With trade openness our imports increased while we cannot promote our exports, so trade balance remained negative. This deficit of trade balance leads to short term and long term loans which adversely affected economic performance, as a major portion of our revenues goes to interest payments rather than developmental expenditures.

These results supported to economic growth in a variety of ways i.e., physical capital and development expenditures increase economic growth while trade openness and real effective exchange rate

decreases economic growth. Economic and social outcomes in Pakistan over the last sixty years are a mixture of paradoxes. The economic growth rate has averaged 5 percent annually since 1947—a feat achieved by very few countries. Politically, however, the interplay of religious fundamentalism, sectarianism, ethnic cleavages and regional economic disparities has made the country volatile and unstable. Various East Asian countries that were behind Pakistan in the 1960s have surged far ahead in most economic and social indicators. Pakistan has thus been unable to realize its potential (Husian, 2009). Our study of internal and external determinants of economic growth has several implications. Pakistan needs to increase developmental expenditures. Underdeveloped infrastructure, low literacy rate and insufficient health facilities are main hurdles in promoting economic growth. To increase economic growth in the long run investment in education is very necessary. Similarly we cannot get benefits from human capital without the provision of better health facilities. Industrial and agricultural sectors cannot be developed without the development of infrastructure. So infrastructure development demands further attention for achieving sustainable growth targets in long run. To sum up trade liberalization policies need further attention of policy makers in Pakistan.

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