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Assessment of Economic Growth in South Asian Countries Using Maddison's Dataset: A Panel Data Approach

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ABSTRACT

Purpose: Despite the plethora of research endeavors to identify the driving forces of economic growth this particular notion is still opaque. The major objective of this study is to identify these driving forces in the context of South Asian countries through a panel data approach using the data set constructed by economic historian Angus Maddison.
Methodology: As a baseline empirical growth model, augmented Solow model is followed for selecting major variables in the econometric analyses which include both Random effects and fixed effects models.
Findings: The regression analyses show that population growth and human capital index are statistically significant explanatory variables for economic growth. This study identifies investment in human capital as a major determinant along with expected direction of association with economic growth.
Limitations: Major limitations of this study are the sample size and assumption of exogeneity of the independent variables.
Practical Implications: This research provides further scope for more research to find out which exogenous variables cause the specific growth patterns of countries within South Asian Region as well as the robustness of the variables.
Originality: South Asian region has been chosen for its specific growth dynamics that has not been covered by previous research endeavors.

1. Introduction

Myriads of studies have been conducted to date to identify the drivers or determinants of economic growth. These studies are conducted in congruence with the existing growth theories. They are complementary to each other in the sense that the growth theories are somewhat open-ended (Brock and Durlauf, 2001). For example, the inclusion of the index of trade openness in a model also encompasses the geographical influence on economic growth. This vagueness in identification of economic growth determinants makes it difficult to formulate effective economic policies. In this paper an endeavor has been made to identify the economic growth drivers of South Asian countries using the

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Maddison's Dataset for GDP, Population and respective growth rates (Maddison, 2006). The data therein are estimates of GDP, population and GDP per capita for many countries over extended time periods.

In this paper South Asian region has been chosen for its growth dynamics. This region consists of nine countries namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka. Due to the unavailability of data in the Maddison's dataset, Bhutan and Maldives were excluded from the construction of the dataset for the analysis. South Asia has been one of the least developed regions in the world with five of the countries being prevalent in the United Nations' list for least developed countries (UN, 2017). However, since 1980s this particular area of the world has been experiencing outstanding economic growth rates which is majorly attributable to the SA4 countries (World Bank, 2006). According to IMF (2017) the growth trend is still persistent for this region despite a slight deceleration in growth rate in 2016. This certain growth dynamic of this region is driven by specific factors and the objective of this paper is to identify the key determinants of economic growth in South Asian Region.

In the academic literature of identifying determinants of economic growth, the main focus has been on including appropriate variables in the linear regression model. The magnitude of literature in cross-country studies is so vast that more than 140 variables have been seen to be correlated with economic growth rate (Moral-Benito, 2009). Among these variables only a few are in fact robustly related to the aforementioned variable (Levine and Renelt, 1992). On the other hand, while considering the weighted average of regression coefficients, majority of them have been quite stably related to the dependent variable (Sala-i-Martin, 1997). In this paper, a panel data framework has been employed to identify the determinants of economic growth in South Asian countries as the use of this framework has been more advantageous in empirical growth regressions than other cross country regression analyses (Moral-Benito, 2009). Panel data framework takes into consideration the generalization of cross-country regressions for a limited number of countries and it also provides scope for solving the inconsistencies, which arises due to omitted and endogenous variables. A vast array of studies exists which have employed this statistical framework in empirical growth regressions (Islam, 1995; Esquivel and Lefort, 1996).

2. Literature Review

The commonly held notion prevalent in growth literature is that economic growth is the best possible way to reduce and ultimately eradicate poverty in developing countries and there are some factors that show association with growth. A frequently cited study by Dollar and Kraay (2001), employing a sample of ninety-two countries from 1960 to 2000, argues that growth actually does reduce poverty. The authors also find that as average income rises, the average income of poorest fifth of the economy also rises. Later one of

the aforementioned authors Kraay (2004) suggests that in the short run 70 percent of the variation in poverty level changes between countries can be explained by variations in general income growth. This measure increases to 97 percent when long-term horizon is considered. These researches provides support to the idea that focusing the growth efforts on the poor, so that it is 'pro-poor' can sometimes be counterproductive and sometimes can cause deterioration in general growth rates, subsequently reversing poverty reduction. Therefore, the notion of determinants of growth and its impact on poverty reduction is not quite straightforward as portrayed by available literature.

As per the definition adopted by United Nations, pro-poor growth can be defined as the growth that significantly increases the income of impoverished people. However, growth literature contains some debates regarding the extent of this increase that will be identified as significant. Lopez (2005) addresses this debate by identifying two streams of literature. The first of these streams focuses on the impact growth has on poverty with respect to inequality. White and Anderson, (2000) further identify two categories of pro-poor growth within this stream. The first category suggests that growth is pro-poor if the income growth of poor relatively surpasses average income growth. The second one denotes that pro-poor growth is what reduces absolute inequality. The second stream of literature identified by Lopez (2005) focuses on poverty irrespective of changes in inequality, also known as 'headcount poverty'.

When analyzing growth, Ravallion (2004) focuses on the percentage change in poverty with respect to 1 percent growth rate, also known as growth elasticity of poverty. As opposed to Kraay's (2004) findings he suggests that the attempt of poverty reduction is strongly determined by the initial level of inequality in the society and not only on the general income growth. Essentially, the lower the level of inequality to start with, the larger the effect of general income growth is on poverty reduction. Lopez and Servén (2004) also have findings similar to that of Ravallion (2004) that a significant obstacle to poverty reduction is high level of inequality. In addition to this finding they also suggest that poverty itself poses an obstacle to poverty alleviation.

3. Growth Theories

The concept of economic growth has been prevalent for several centuries but the scope of pure theorizing of growth is still underexploited (Spratt, 2009). Before the European revolution, the notion of growth was limited to exploiting resources to one's own advantage. The benefits of open competition were widely ignored as growth at least in part, a zero sum game, where to 'beggar thy neighbor' was the absolute route to success. This 'mercantilist' approach was vitiated by the work of Adam Smith and later David Ricardo. Modern growth theory is essentially an extension of the work of these initiators of classical economics (Spratt, 2009). Smith (1776) argues that growth is a product of increasing productivity, which in turn is generated from division of labor and increased

specialization. Additionally, not only division of labor increases productivity but also allows a surplus to be generated which can be profitably traded with other producers specializing in other goods. Ricardo (1817) on the other hand incorporates the idea of 'law of diminishing returns' with existing growth theory and suggests that growth comes to an end eventually resulting in a 'steady state' economy. However, such steady state can be avoided through technical progress and/or international trade. Nevertheless, for both Smith and Ricardo, division of labor and specialization are significant determinants of increased productivity and economy growth.

Modern growth theory grows upon the work of these originators of classical economics. The Harrod-Domar model (HDM) was developed in the 1930s and has been a dominant growth model until 1950s. The fundamental prediction of HDM is that national growth rates are directly associated with investment level in the economy. A key implication of the theory is in order to kick start growth, countries where low savings rate prevails should borrow to invest in physical capital, which will initiate a virtuous growth cycle leading to increased income, higher level of savings, higher investment in physical capital and henceforth, increased growth rate (Spratt, 2009). Additionally, Easterly (1997) identifies that rapid industrialization of Soviet Union was evident because of the forced savings and investment in physical capital, validating the prediction of HDM. Later, Sir Arthur Lewis (1955) makes an assumption that to achieve a real per capita growth, which is significantly greater than population growth, investment level in the economy is required to rise up to 12 percent of GDP. Rostow (1960) further argues that among the different stages of economic growth the key stage is the point where the economy takes-off. At this point the growth becomes self-sustaining and 'take-off' is determined by the level of investment in the economy approaching 10 percent of GDP. Furthermore, the 'financing gap' approach based on HDM has been designed to be a time limited fund injection for boosting investment and achieving the aforementioned 'take-off'. However, the debt burden that the developing countries were taking on has been ignored on the ground that the growth in future would offset the gap. The growth in many of these countries has not followed the prediction and experienced stagnant or even negative growth in per capita income juxtaposed with rising debt level. After the evident failure of this model because of being superseded on theoretical ground, the neo-classical growth model (NCM), was developed in the 1950s by Robert Solow.

3.1 Solow's Neo-classical Growth Model

In response to the unrealistic assumptions of fixed ratios of capital-labor and capital-output Robert Solow adapted this model in 1950s. In this model the proportions of capital and labor employed can be varied and one of the major assumption is the diminishing returns to capital as opposed to constant returns in the HDM. Consequently, the ultimate

increase in output will be such that the growth rate of economy will equal the population growth rate. If population growth is zero, economic growth will therefore also be zero.

In the Solow model, the production function can be written as follows:

$$Y = A*F\ (K, H, E*L) \qquad (1)$$

Where:

Y - Income/output,

A - Technological progress,

F - A function of,

K – Capital,

H - Human capital,

E - Productivity of labor,

L - Labor force.

And the evolution of the capital stock is determined by:

$$\Delta K = S^{r} * F\ (K, H, E*L) - dK \qquad (2)$$

Where:

d = Depreciation rate.

Solow's model was able to avoid reaching this 'end-state' by incorporating technological progress (A). Thus, in the absence of technological progress, output (growth) is a function of physical and human capital accumulation and the size of the population, or labor force (L).

Solow assumes technological progress is something that is not the result of internal economic forces in society, but is an external input. This model is able to explain the aspects of growth which result from increases in the stock of physical and human capital and the labor force, but not that resulting from technological change. This unexplained portion was termed the ' Solow residual' and was an increasing source of dissatisfaction with Solow' s model amongst economists. This is not surprising, as estimates suggested that the share of growth accounted for by the Solow residual was not small. Economists increasingly came to see technological change as the key determinant of divergent growth rates between countries, and were understandably dissatisfied with a growth model that was unable to explain the determinants of this progress.

An influential paper by Mankiw, Romer and Weil (1992) denotes that the answer to the question of some countries being poorer than other countries might be provided by Solow's model of economic growth augmented to include human capital investment. According to this model an economy's steady-state path for the logarithm of per capita

output has a linear time trend. The slope of this linear trend is exogenously determined by the rate of technological progress while the intercept reflects the rate of population growth and the shares of output devoted to investment in physical and human capital.

4. Methodology

4.1 Data

The data set for this study encompasses the period of 1971-2008 for Seven South Asian countries of which the data regarding the dependent variable, growth rate of GDP and two of the independent variables: Population and growth rate of population are taken from the Maddison's Dataset. The Maddison dataset constructed by late economic historian Angus Maddison (1926-2010), a famous compiler and creator of GDP and growth statistics, contains estimates of such statistics for an extended period of time covering diverse geographical regions. The work of Maddison was later launched as the Maddison Project, also known as the Maddison Historical Statistics Project, which is a project to collate historical economic statistics as a continuation of Maddison's work.

The whole array of data has been accumulated based on two factors: comparability with existing literature and intention to construct a balanced panel. There are 19 independent variables in the data set, which are presented along with their sources in (Table 2) in Appendix. As data for some variables was not available for Afghanistan and Myanmar for the aforementioned period, those specific values have not been considered for these two countries.

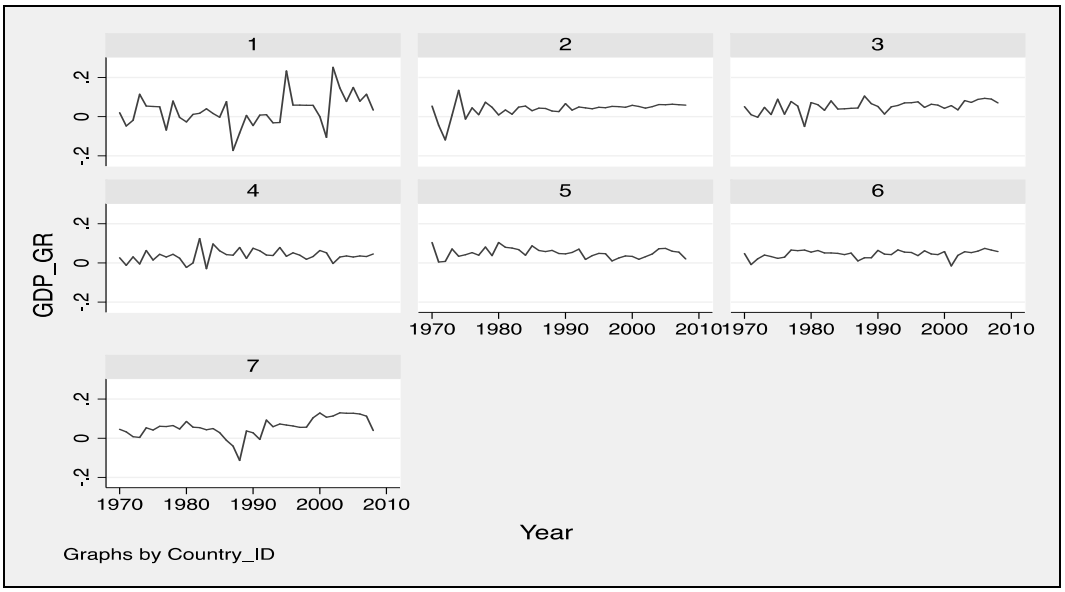

Figure 1. Annual GDP Growth Rate by Country where 1 = Afghanistan, 2 = Bangladesh, 3 = India, 4 = Nepal, 5 = Pakistan, 6 = Sri Lanka, 7 = Myanmar for the period of 1971-2008

The panel data is organized by specifying the time series element in five-year period i.e. the dependent variable is the geometric growth rate over five year period (Table 5) in Appendix and the rest of the variables except for population growth rate and the time invariant variables, are expressed as five year geometric averages. The geometric average is applied on the variables in order to normalize the ranges of years incorporated in the analysis.

(Table 3) in Appendix presents the summary statistic for all the variables under this study for the chosen countries. Figure 1 is constructed to show the annual growth rate in GDP for all the countries in the sample. It can be observed that Afghanistan has been experiencing spikes and surges throughout the sample period due to lack of private investment and consumer demand resulting from continuous political insecurities (World Bank, 2017). For Bangladesh the growth has been quite stable after 1980s during which it experienced major political reforms subsequent to independence in 1971. India, Pakistan and Sri Lanka have managed to maintain overall positive economic growth rate throughout this time period and endured quite similar trend. Nepal and Myanmar both have endured economic volatility due to civil conflict and distorted political institutions during this period, which explains the volatility in the growth rates (Deraniyagala, 2005). (Figure 2) represents the 5-year geometric growth rate throughout the sample period.

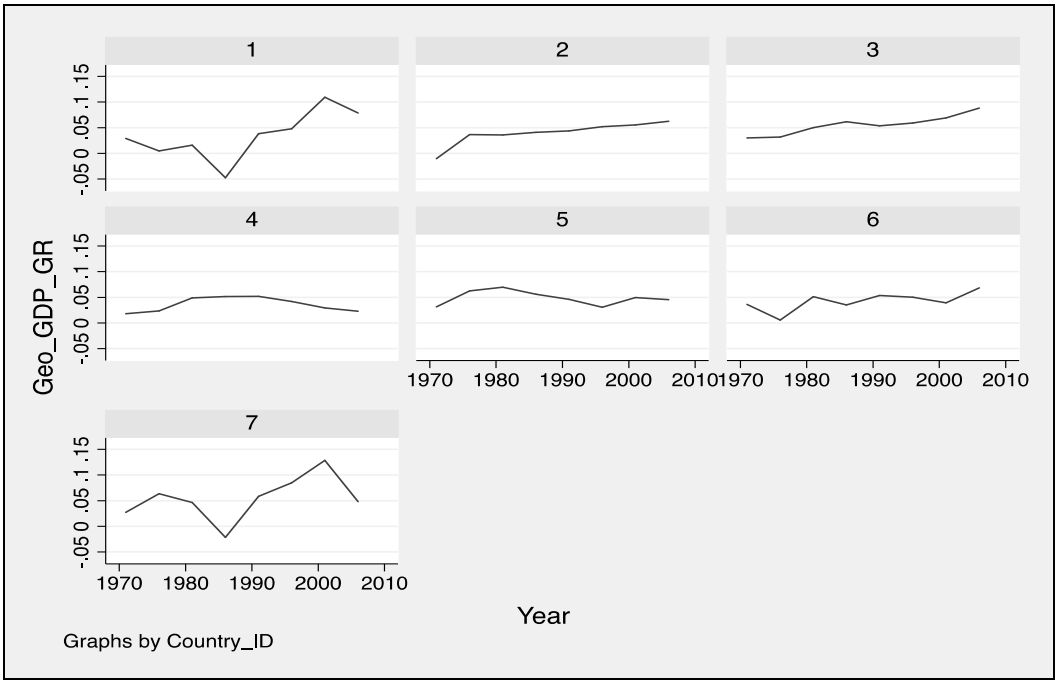

Figure 2. Geometric Growth Rate over 5-year period of GDP by Country where 1 = Afghanistan, 2 = Bangladesh, 3 = India, 4 = Nepal, 5 = Pakistan, 6 = Sri Lanka, 7 = Myanmar for the period of 1971-2008

4.2 Independent Variables

Augmented Solow model is considered as a baseline empirical growth model, which is the basis for selecting nine variables in the econometric analyses. To capture the impact of physical and human capital accumulation, initial income and population growth on economic growth, investment share of GDP, population and population growth, gross capital formation, initial GDP, human capital index, life expectancy at birth, ratio of workers to population and percentage of urban population have been incorporated in the model. In addition to these four basic influences (i.e. physical and human capital accumulation, initial income and population growth on economic growth) reflected by augmented Solow model, ten other independent variables have been included which are then divided into three generic categories. These additional variables have been chosen based on a review of literature executed by Durlauf, Johnson, and Temple (2005) where they assess 43 different growth theories and 145 probable explanatory variables and each of the surveyed growth theory has been statistically significant in at least one research endeavor. Based on the aforementioned two factors influencing the selection of independent variables, the three broad categories include only a subset of these 145 variables.

4.2.1 Macro-economic and External Environmental Variables

As an indicator of stable macroeconomic environment government consumptions as a percentage of GDP has been considered. Many researchers have used this measure as a proxy for economic stability since the study of Barro (1991). Here, two measures for consumption has been incorporated in the model due to unavailability of data from a single source and uniform measure. Investment is another variable that captures economic stability and volatility. To demonstrate the effect of external environment degree of trade openness, which is measured by the total volume of trade in a country as a percentage of GDP, has been selected. Many researchers criticize this measure because it does not indicate the nature of trade policies. However, some significant studies do incorporate this measure in respective models (Levine and Renelt, 1992; Frankel and Romer, 1995).

4.2.2 Quality of Institutions and Governance Variables

There have been numerous studies regarding the impact of political freedom and the quality of institutions in the economic growth of countries (Kormendi and Meguire, 1985; Barro, 1991; Barro and Lee, 1994; Sala-i-Martin, 1997). In this paper, political rights and civil liberty indices from the Freedom House reports are considered in order to measure the concentration of political power, fairness of elections and strength of institutions.

4.2.3 Geographic and Time Invariant Variables

A school of thought exists which advocates the argument that geographical factors play a significant role in determining the economic development (Sachs and Warner, 1997; Bloom and Warner, 1998). To identify the influence of geographic factors on GDP growth, total land area in square kilometers and landlocked dummy are used. Other factors which are not geographical in nature are also incorporated as fixed or time invariant variables such as timing of independence (Gallup et. al., 2001), British Colony Dummy, to determine the impact of some country specific fixed factors.

5. Results

(Table 1) reports the results of both fixed effects and random effect generalized least square regression on geometric growth rate of the aforementioned countries. The regression equation applied here is:

$$\begin{aligned}\text{GDPGr} = {} & \beta_{0i} + \beta_t + \beta_1(Inv) + B_2(PopT) + \beta_3(\text{PopGr}) + \beta_4 \log(\text{IGDP}) + \\ & \beta_5(HCI) + \beta_6(LE) + \beta_7(WForce) + \beta_8(UP) + \beta_9(GCAP) + \beta_{10}(GovtC) + \\ & \beta_{11}(C) + \beta_{12}(CGDP) + \beta_{13}(TO) + \beta_{14}(PolR) + \beta_{15}(CivL) + \beta_{16}(Land) + \\ & \beta_{17}(Landlock) + e_{it}\end{aligned} \qquad (3)$$

Where:

Inv- Investment

PopT - Population in thousands,

PopGr - Population Growth,

IGDP - initial GDP,

HCI - Human capital index,

LE - Life Expectancy,

WForce - Work Force,

UP - Urban population,

GCAP - Gross Capital,

GovtC - Government Consumption,

C- Consumption,

CGDP - Consumption Share of GDP,

TO -Trade Openness,

PolR - Political Rights,

CivL - Civil Liberties,

Land - Land area,

Landlock - Landlocked Dummy.

The first two terms denote intercept parameters that vary across countries selected and years. The error term has the usual properties in the panel settings applicable to both Fixed Effects (FE) and Random Effects (RE) Models. Although the Hausman test (Table 4) in Appendix signified that Random effects is more appropriate for this analysis, Fixed Effects regression is also conducted to control for country specific characteristics. In order to take heteroskedasticity into account the results of the regression have been generated based on robust or White-Huber standard errors. Several variables have been dropped from the analyses due to multicollinearity.

Table 1. Results of Fixed and Random Effects GLS Regressions

Fixed Effects GLS Regression of Geometric Growth Rate			
$R^2 = 0.1106$			
Variables	Coefficient	t	P>|t|
Investment	0.2545535	0.73	0.504
Population	-1.41e-08	-0.19	0.860
Population Growth Rate	1.680324**	5.94	0.004
Human Capital Index	.0702894**	3.00	0.040
Life Expectancy	-.0011085	-1.11	0.330
Workforce	.0882862	0.67	0.541
Urban Population	-.0334568	-0.39	0.717
Gross Capital	-.0287503	-0.10	0.928
Government Consumption	.0949356	0.36	0.734
Consumption	-.1083679	-1.11	0.330
Consumption Share of GDP	-.0222633	-0.17	0.871
Trade Openness	-.0381931	-1.45	0.220
Political Rights	.0027721	0.61	0.576
Civil Liberties	.0035824	0.83	0.453
Constant	-.0336891	-0.28	0.794

Random Effects GLS Regression of Geometric Growth Rate			
Variables	Coefficient	z	P>|z|
Investment	.2869898	1.40	0.161
Population	-1.85e-08	-0.33	0.739
Population Growth Rate	1.672447***	5.37	0.000
Logarithm of Initial GDP	.1236188*	1.94	0.053
Human Capital Index	.0733486***	8.55	0.000
Life Expectancy	-.0010722	-1.06	0.291
Workforce	.0899839	0.68	0.498
Urban Population	-.0369196	-0.48	0.635
Gross Capital	-.0448469	-0.19	0.853
Government Consumption	.0687378	0.48	0.632
Consumption	-.1184929**	-2.50	0.012
Consumption Share of GDP	-.0007055	-0.03	0.974
Trade Openness	-.0410771	-1.18	0.239
Political Rights	.0028554	0.67	0.506
Civil Liberties	.003477	0.86	0.388
Land	-9.87e-08**	-2.71	0.007
Landlocked Dummy	.1658103**	2.20	0.028
Constant	-1.315657	-1.81	0.071
$R^2 = 0.7349$			

Source: Authors Calculation

Note: *** p<0.01, ** p<0.05, * p<0.1

6. Discussion

From the regression analyses it can be observed that 73.49 percent of variation in dependent variable can be explained by variations in independent variables for Random Effects GLS regression and for Fixed Effects the coefficient of determination is 11.06 percent. In both cases, population growth and human capital index are statistically significant explanatory variables for economic growth at $\alpha = 0.05$ for Fixed Effects and at $\alpha = 0.001$ for Random Effects, which is in congruence with the Solow model although population growth bears opposite sign. In Random effects regression three more variables are significantly related to economic growth rate, which are consumption share of GDP, total land area and landlocked dummy variable. All three variables are oppositely related to growth as observed in theories and literature. A study of Krugman (1991) shows that better geographical situation measured in proximity and easy access to international market as opposed to being landlocked has a significant impact on economic growth. In

addition to that, the studies conducted by Sala-i-Martin (1997) and Barro (1991) have demonstrated significant impact of political rights and democracy on economic growth which is not observed in the analyses conducted on the dataset for South Asian countries. The research conducted by Moral-Benito (2009) also demonstrates government consumption, investment share of GDP, Civil liberty index from Freedom House report to be robust explanatory variables of economic growth. These relationships are clearly absent in the current analyses. One plausible reason for such anomaly may be the sample size. The current dataset only contains seven countries in South Asia whereas the empirical studies have been conducted on global data. Another reason is the five-year averaging in order to make the data more standardized has caused to the time series component of the Panel dataset too small resulting in a contraction of dataset lengthwise. When controlled for the time fixed effect; it turned out Year 1996-2000 and 2006-2008 are two significant time slots where the independent variables had a significant impact on economic growth.

7. Conclusion

Despite the plethora of research endeavors to identify the driving forces of economic growth this particular notion is still opaque. The major objective of this study has been to identify such factors in the context of South Asian countries. Based on the econometric analyses it can be seen that population growth and human capital index are statistically significant explanatory variables for economic growth, although population growth assumes a relationship that is contrary to the hypothesized relationship. In addition to this finding, the results of Random effects GLS regression denote that there are three more variables within the pool that affect economic growth namely consumption share of GDP, total land area and landlocked dummy variable, but in a direction opposite to the evidence backed by theory and literature. These findings can be rationalized by shedding light on the imitations of the study.

8. Limitation

One of the major limitations of this study is the sample size of seven countries, which often does not allow for analyses to make robust inferences. Another shortcoming of the study is that all the independent variables are assumed to be strictly exogenous, which may cause the results of panel data regression to be distorted. However, the panel regression analysis using Maddison's dataset containing GDP and population growth has been another pursuit to add to the literature of economic growth determinants. The implications of this study include increased investment in human capital as it has been identified as a major determinant along with expected direction of association with economic growth. There is further scope for more research to find out which exogenous variables cause the specific growth patterns of countries within South Asian Region as well as the robustness of the variables.

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Appendix

Table 2: Variable Definitions and Sources

Variables	Sources	Definition
Geometric Growth Rate of GDP	Maddison's Project Database, 2013	Geometric Growth Rate of GDP over 5-year period
Investment share of GDP	Federal Reserve Bank of St. Louis	Investment Share of GDP Per Capita at constant price
Population	Maddison's Project Database, 2013	Population ('000 at mid-year)
Population Growth Rate	Maddison's Project Database, 2013	Geometric Growth Rate of Population over 5-year period
Logarithm of Initial GDP	Maddison's Project Database, 2013	Logarithm of Initial GDP (1971)
Human Capital Index	Penn World Table 9.0	Human capital index, based on years of schooling and returns to education
Life Expectancy	World Development Indicators	Life expectancy at birth, total (years)
Workforce	Penn World Table 9.0	Ratio of workers to population
Urban Population	Penn World Table 9.0	Urban population (% of total)
Gross Capital	Penn World Table 9.0	Share of gross capital formation at current PPPs
Government Consumption	World Development Indicators	General government final consumption expenditure (% of GDP)
Consumption	Penn World Table 9.0	Share of household consumption at current PPPs
Consumption Share of GDP	Federal Reserve Bank of St. Louis	Consumption Share of Purchasing Power Parity Converted GDP Per Capita at constant prices
Trade Openness	World Development Indicators	Import and Export as a percentage of GDP
Political Rights	Freedom House	Political Rights (1 = Best, 7 = Rorst)
Civil Liberties	Freedom House	Civil Liberties (1 = Best, 7 = Worst)
Land	UN	Total land area in kilometer squared
Landlocked Dummy	Wikipedia	Landlocked=1, otherwise = 0
Independence	CIA	Timing of national independence measure: 0 if before 1914; 1 if between 1914 and 1945; 2if between 1946 and 1989 and 3 if after 1989
British Colony	Wikipedia	British Colony=1, Otherwise = 0

Source: Authors Derived

Table 3: Summary Statistic of Variables

Variables		Mean	Standard Deviation	Minimum	Maximum
Geometric Growth Rate of GDP	Overall	0.04	0.03	-0.05	0.13
	Between		0.01	0.03	0.06
	Within		0.03	-0.04	0.12
Investment share of GDP	Overall	0.20	0.06	0.04	0.35
	Between		0.04	0.15	0.26
	Within		0.04	0.10	0.30
Population	Overall	168130.40	292994.10	12639.47	1136485.00
	Between		303946.70	17334.64	850254.10
	Within		72248.42	-102224.10	454361.60
Population Growth Rate	Overall	0.02	0.01	-0.02	0.07
	Between		0.00	0.01	0.03
	Within		0.01	-0.02	0.07
Logarithm of Initial GDP	Overall	10.34	1.33	8.95	13.07
	Between		1.43	8.95	13.07
	Within		0.00	10.34	10.34
Human Capital Index	Overall	1.60	0.47	1.05	2.89
	Between		0.44	1.27	2.49
	Within		0.23	1.12	2.00
Life Expectancy	Overall	58.50	8.23	38.10	74.20
	Between		6.17	49.35	69.78
	Within		5.88	46.08	70.62
Workforce	Overall	0.37	0.10	0.25	0.56
	Between		0.11	0.27	0.52
	Within		0.02	0.32	0.42
Urban Population	Overall	0.21	0.07	0.04	0.36
	Between		0.07	0.10	0.31
	Within		0.04	0.11	0.31
Gross Capital	Overall	0.15	0.07	0.03	0.33
	Between		0.05	0.08	0.22
	Within		0.05	0.04	0.26

Government Consumption	Overall	0.09	0.03	0.04	0.15
	Between		0.03	0.05	0.11
	Within		0.01	0.06	0.13
Consumption	Overall	0.69	0.08	0.51	0.96
	Between		0.06	0.61	0.78
	Within		0.05	0.60	0.87
Consumption Share of GDP	Overall	0.68	0.28	0.08	1.11
	Between		0.29	0.10	0.90
	Within		0.06	0.56	0.89
Trade Openness	Overall	0.37	0.24	0.00	1.14
	Between		0.23	0.01	0.69
	Within		0.14	0.03	0.91
Political Rights	Overall	4.46	1.85	2.00	7.00
	Between		1.75	2.25	7.00
	Within		0.87	2.71	6.46
Civil Liberties	Overall	4.80	1.37	3.00	7.00
	Between		1.35	3.13	6.63
	Within		0.54	3.18	5.80
Land	Overall	824737.10	1052115.00	65610.00	3287263.00
	Between		1126222.00	65610.00	3287263.00
	Within		0.00	824737.10	824737.10
Landlocked Dummy	Overall	0.29	0.46	0.00	1.00
	Between		0.49	0.00	1.00
	Within		0.00	0.29	0.29
Independence	Overall	1.57	0.74	0.00	2.00
	Between		0.79	0.00	2.00
	Within		0.00	1.57	1.57
British Colony	Overall	0.71	0.46	0.00	1.00
	Between		0.49	0.00	1.00
	Within		0.00	0.71	0.71

Source: Authors Derived

Table 4: Results of Hausman Test

Variables	Coefficients	Difference	S.E.
Investment	0.2545535	.2869898	.2038253
Population	-1.41e-08	-1.85e-08	2.92e-08
Population Growth Rate	1.680324	1.672447	.2152807
Human Capital Index	.0702894	.0733486	.0200557
Life Expectancy	-.0011085	-.0010722	.0005186
Workforce	.0882862	.0899839	.1079072
Urban Population	-.0334568	-.0369196	.054486
Gross Capital	-.0287503	-.0448469	.1079072
Government Consumption	.0949356	.0687378	.1715723
Consumption	-.1083679	-.1184929	.0649723
Consumption Share of GDP	-.0222633	-.0007055	.13395
Trade Openness	-.0381931	-.0410771	.0201904
Political Rights	.0027721	.0028554	.0009335
Civil Liberties	.0035824	.003477	.0021212
Chi2(13) = 0.03 Prob>chi2 = 1.0000			

Source: Authors Derived

Table 5: Geometric Growth Rate 1971-2008

Country	1971-75	1976-80	1981-85	1986-90	1991-95	1996-00	2001-05	2006-08
Afghanistan	2.92%	0.47%	1.62%	-4.74%	3.84%	4.77%	10.92%	7.84%
Bangladesh	-1.01%	3.66%	3.58%	4.10%	4.39%	5.21%	5.53%	6.27%
India	3.01%	3.19%	5.03%	6.16%	5.36%	5.91%	6.88%	8.83%
Myanmar	2.75%	6.35%	4.64%	-2.14%	5.84%	8.48%	12.86%	4.82%
Nepal	1.81%	2.34%	4.90%	5.14%	5.19%	4.19%	2.94%	2.29%
Pakistan	3.16%	6.25%	6.99%	5.60%	4.63%	3.08%	4.97%	4.55%
Sri Lanka	3.63%	0.58%	5.13%	3.53%	5.38%	5.04%	3.94%	6.83%

Source: Maddison's Project Database, 2013.