

## The Determinants and Projections of Saving Rates in South Asian Countries

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**Abstract:** *Using OLS, Fixed Effect, Random Effect models both with and without lag value, we found that domestic saving rates in Bangladesh, India, Pakistan, Sri Lanka and Nepal have, in general, been high and rising but there have been substantial differences from economy to economy. The main determinants of the domestic saving rates during the 1971-2009 period appear to have been the age structure of the population (especially the aged dependency ratio, youth dependency ratio), income level, and the level of financial sector development, and moreover, that the direction of impact of each factor has been more or less as expected. We analyzed the past trends of domestic savings behaviour, and, based on those trends, project the future trends of domestic saving rates in the selected countries for the period 2011-2030. We find that the domestic saving rates in developing Asia as a whole will remain roughly constant during the next two decades. However this future projection of savings does not necessarily imply exact figure of savings in these countries as it depends also on other factors such as the economic size, differences in financial structure across countries, fiscal policy, monetary policy, coordination of nations etc.*

**Keywords:** *Trends of Savings, Determinants of Saving, Time series data, OLS, Fixed effects, Random effects.*

### Section I

#### 1. Introduction

The role of Savings in the process of economic development has long been a fundamental axiom of development theory, with its basis in such classic analyses as Rostow's stages of growth and Lewis's growth theory and the early growth

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models of Harrod-Domar and others. In these analyses, an increase in the rate of saving was isolated as a key factor underlying a nation's ability to achieve a sustained increase in its growth rate.

Developing Asian countries' domestic saving rates and national saving rates are relatively higher than those of the developed countries. These high saving rates have made possible high levels of domestic investment those but have also led to large capital outflows (Park and Shin (2009). Bernanke (2005) asserted that, the developing economies of Asia have oversaved and underinvested, leading to large current account imbalances (surpluses). What are the key determinants of domestic savings rate in those developing countries? What made them to save more? Marx-Keynes viewed savings as a passive determinant of investment so that macroeconomic equilibrium can hold and influence the growth rate of output. In this view, growth gone rates savings.

The purpose of this paper is to present data on trends over time in domestic saving rates in economies in selected developing South Asian countries during the period 1971-2009, to analyze the determinants of those trends, and to project trends in domestic saving rates in these same economies during the next two decades based on the estimation results.

In the paper, we selected five South Asian neighbouring countries, names Bangladesh, India, Pakistan, Nepal and Sri Lanka. As the economies of these countries are almost the same, we took these countries as our sample. We present the data on real measures of domestic saving rates to show the past trends of saving rates for the selected countries and the key determinants of domestic saving rates in those countries. Finally, we attempt to project the future trends of domestic saving rates in these countries.

Various factors affect domestic saving rates, but according to our estimation results, the age structure of the population, the degree of financial sector development, and income levels are the major determinants. Looking first at the impact of the age structure of the population, we found that the aged dependency ratio (the ratio of the population aged 65 and older to the population aged 15-64) has a negative and significant impact on the domestic saving rate, since the elderly finance their living expenses largely by drawing down their previously accumulated savings. This implies that the aging of a population will put downward pressure on domestic saving rates. The youth dependency rate (the ratio of the population aged 14 and under to the population aged 15-64), which would also be expected to put downward pressure on the domestic saving rate, has shown the opposite trend, declining in all of the economies in our sample. The degree of financial sector development would also be expected to influence domestic saving rates because people can be expected to do less precautionary saving if they know that they can borrow when the need arises. Our estimation results show that the degree of finan-

cial sector development and the domestic saving rate have a nonlinear relationship.

The study has the following specific objectives:

- i) To identify the key determinants of domestic savings rate in selected south Asian countries.
- ii) To delineate the trends over time in domestic savings rates in the selected countries.
- iii) To project the future trends of domestic savings rate in those countries.

The paper is organized as follow: Following the Introduction, Section II describes the literature on the subject and Section III illustrates the methodology and data. Section IV explains domestic savings rates. Section V describes estimation and results. Section VI delineates the Projection of saving rates in South Asian Countries. Section VII contains concluding remarks.

## **Section II**

### **LITERATURE REVIEW**

There have been many previous empirical analyses of the determinants of saving rates using time series, cross-section or panel cross-country data. Many researchers tried to find the determinants and most of these researches focused on advanced economies, but very few studies paid attention to developing countries. To the best of our knowledge, there is no study conducted to find the determinants of savings based on the selected countries, which we included as our sample.

Cross-section studies by Leff (1980) concluded that dependency ratios were an important determinant of differences in saving behaviour across countries. Ram (1982) empirically found that, saving seemed to be negatively correlated with dependency rates among developed countries, but positively correlated among developing countries. David M. Cutler, M. Poterba, Summers (1990) based on American economies found that increased dependency ratio will reduce living standard by 5-10 percent in the long run.

Kivilcim Metin Ozcan, Asli Gunay and Seda Ertac by using data covering 1968-1994 found negative impact of life expectancy rate, which lends support to the life-cycle hypothesis. The precautionary motive for saving is supported by the findings that inflation captures the degree of macroeconomic volatility and has a positive impact on private saving in Turkey.

Schultz (2004) found large demographic effects on saving in Asia, and exaggerated the impact by including lagged saving in the regression analysis of 85 country sample and the sub-sample of non-industrial Asian countries. Thus concluded, Asia is the source of much of the macroeconomic evidence in support of large

demographic effects on saving.

Charles Yuji Horioka (2007) analyzed the impact of population aging on the household, private, government, and national saving rates and found that population aging will lead to declines in household, private, government, and national saving rates, but to the extent that population aging is accompanied by absolute declines in population, investment rates will also decline, and moreover, countries always have the option of borrowing from abroad. Thus, the decline in saving caused by population aging will not necessarily spell disaster.

By using the GMM estimator Nola Reinhardt (2007) based on Latin America showed the persistence of saving behaviour in which lagged saving has been found as a significant positive predictor of current saving.

By using a panel data set of 85 countries covering 1960-2005 to investigate the macroeconomic linkages between national rates of saving and investment and population aging, Barry Bosworth and Gabriel Chodorow-Reich (2007) found a significant correlation between the age composition of the population and nations' rates of saving and investment, but the effects vary substantially by region. They also found evidence of demographic effects on both the public and private components of national saving. Most aging economies will ultimately be pushed in the direction of current account deficits.

Park and Shin (2009) and most other studies find that both the aged dependency ratio and the youth dependency ratio decrease the saving rate. These studies found a negative impact of aged dependency and youth dependency on the savings rate. They also found that if real GDP growth rate is high for a country, it causes high income growth and saving rates and that savings will help for further growth by rapid capital accumulation and concluded that the growth of lagged real per capita GDP rates also promote the saving rate.

In the paper titled "Determinants of Private Saving in Turkey", Caroline Van Rijckeghem (2010) based on Turkstat demographic projections, found that demographic changes—a reduction in the youth dependency ratio combined with an increase in the old-age dependency ratio—will be at best neutral for the private saving rate. Meanwhile, reforms to social security may stimulate private saving over time, but this is uncertain as the social security reform also includes a lengthening of the contribution period, which should reduce private saving for retirement.

Study by Nicholas Apergis and Christina Christou (2012) to investigate the impact of the age dependency ratio on domestic savings rates for 16 African countries found evidence of panel cointegration and concluded that dependency ratio affected savings rate negatively.

### Section III

#### METHODOLOGY AND DATA

For this Study, we utilize secondary data from various sources. This study uses yearly time series data on domestic savings for five selected South Asian developing countries, namely Bangladesh, Pakistan, India, Nepal and Sri Lanka over the period of 1971 to 2009 compiled from the World Development Indicator (WDI), World Bank database and IMF dataset. For real measure of Gross Domestic Savings rate and to see trends over time, we collected data from Penn world table (version 7.1). For analyzing the dataset, we employed OLS, Fixed effects model and Random Effects Model. Since the sample size is small, to avoid the loss of degrees of freedom we consider yearly data for our study. The life cycle model has an important role for determining the variable for our study.

A study by Park and Shin (2009) found that Savings rate decreases as aged dependency and youth dependency increase. As old people finance their living expenses by their previous earned savings and as children generally consume without any earning of income, both should have a negative impact on saving rate. If the real GDP rises, it will typically help to save more and finally it will help further capital accumulation which promotes further growth. A study by Bosworth and Reich (2009) found that lagged real per capita GDP growth rates increases savings rate. Beside those GDP related and demographic factors, there are some other factors which have strong impact on savings rate i.e.-financial sector development. As more savings instruments are available, it will help to save more. The real interest rates also have impact on savings rates.

#### Econometric Specification:

The following model is to be used for our empirical analysis:

$$RDSR_{i,t} = \alpha_{0,i} + \alpha_1^* ADR_{i,t} + \alpha_2^* CDEP_{i,t} + \alpha_3^* LPRGDP_{i,t} + \alpha_4^* SQLPRGDP_{i,t} + \alpha_6^* CREDIT_{i,t} + \alpha_7^* SQCREDIT_{i,t} + \alpha_7^* X_{i,t} + u_{i,t}$$

Where,

$i = 1 \dots 5$  [1(Bangladesh), 2(India), 3(pakistan), 4(Nepal), 5(sri lanka)].

$t = 1 \dots 39$  [1 = 1971, 2 = 1972 ... ..]

$RDSR_{i,t}$  = Real Domestic Saving Rate in country  $i$  at time  $t$

$ADR_{i,t}$  = Aged Dependency Ratio (ratio of the population aged 65 or older to population aged 15-64) in country  $i$  at time  $t$

$CDEP_{i,t}$  = Youth Dependency Ratio (ratio of the population aged 14 or younger to population aged 15-64) in country  $i$  at time  $t$

$LPRGDP_{i,t}$  = Log Of Per Capita Real GDP in country  $i$  at time  $t$

$SQLPRGDP_{i,t}$  = Square of Log Of Per Capita GDP in country  $i$  at time  $t$

$CREDIT_{i,t}$  = ratio of private credit from deposit money banks and other financial institute to GDP in country  $i$  at time  $t$

$SQCREDIT_{i,t}$  = Square of  $CREDIT_{i,t}$  in country  $i$  at time  $t$

$X_{i,t}$  = Vector of other explanatory Variables included in the estimated model in country  $i$  at time  $t$

$u_{i,t}$  = error

$\alpha_{0,i}$  = a constant plus country fixed effect when a fixed effect model is calculated

In addition, in some cases, we included

$CHGDP_{i,t}$  = Growth rate of real per capita GDP and

$RINT_{i,t}$  = Real Interest rate in country  $i$  at time  $t$

As there are some variables in our model which are endogenous, to alleviate biasness, we used one period lags of  $LPRGDP$ ,  $SQLPRGDP$ ,  $CREDIT$ ,  $SQCREDIT$  and  $CHGDP$  in some model.

## Section IV

### DOMESTIC SAVINGS RATE AND ITS PAST TRENDS

To analyze the past trends of domestic savings rate in the selected South Asian countries, we see the real domestic savings rate for which Table 1 is used for the period of 1971 to 2009. We used here real measure because using a real measure is preferable from a theoretical point of view, and a number of authors (such as Aghion, Comin, Howitt, and Tecu (2009) and Shioji and Vu (2011)) have used a real measure of saving, so we decided to use the real domestic saving rate as our dependent variable throughout our regression analysis.

To calculate real domestic savings rate, formula used as

Real domestic savings rate =  $100 - kg - kc$

Where,

$kg$  = government share of real GDP per capita

$kc$  = consumption share of real GDP per capita

And for that calculation, we used Penn World Table, Version 7.1.

From Table 1, it is seen that there are different shapes of domestic saving rate in these countries. Average real domestic savings rate in Bangladesh during the period 1971 to 2009 is calculated as 11.11375 percent whereas in India and Pakistan it is, respectively, 19.6 percent and 10.45 percent.

In the period 1971-1975, Bangladesh showed negative real savings rate, the reason may be the liberation war which was conducted in 1971. In the time period 1976 to 1985, the trends of savings was high and showed gradual upward tendency whereas in the period 1986-1990, it slowed a little. But from the period 1991-95, when Bangladesh transited from closed to open economy, real domestic savings rate has been rising gradually.

During the period 2006-2009, real savings rate of all countries except Pakistan showed upward trends. Pakistan in fact showed a little bit low rate than the previous period, compared to other countries.

The highest average real savings rate was in India (19.6 percent) whereas Nepal showed relatively lowest percentage of 10.43 percent. For each country, real domestic savings was gradually showing rising trends in the recent years.

Sri Lanka showed the second highest average savings rate of 17.71 percent. The highest savings rate for that country was 22.16 in the period 1976-80 but in 1986-90, her domestic savings rate was the lowest during the period of 1971 to 2009.

The range of real domestic savings rate was from 19.6 percent in India to 10.427 percent in Nepal. Thus from the table it is seen that the ranking order of these countries is almost the same. Trends of real domestic savings rate throughout the period 1971 to 2009 showed upward trends as a whole for those selected South Asian countries.

**Table 14: Real measures: Past Trends over Time in Gross Domestic Savings Rate (1971-2009)**

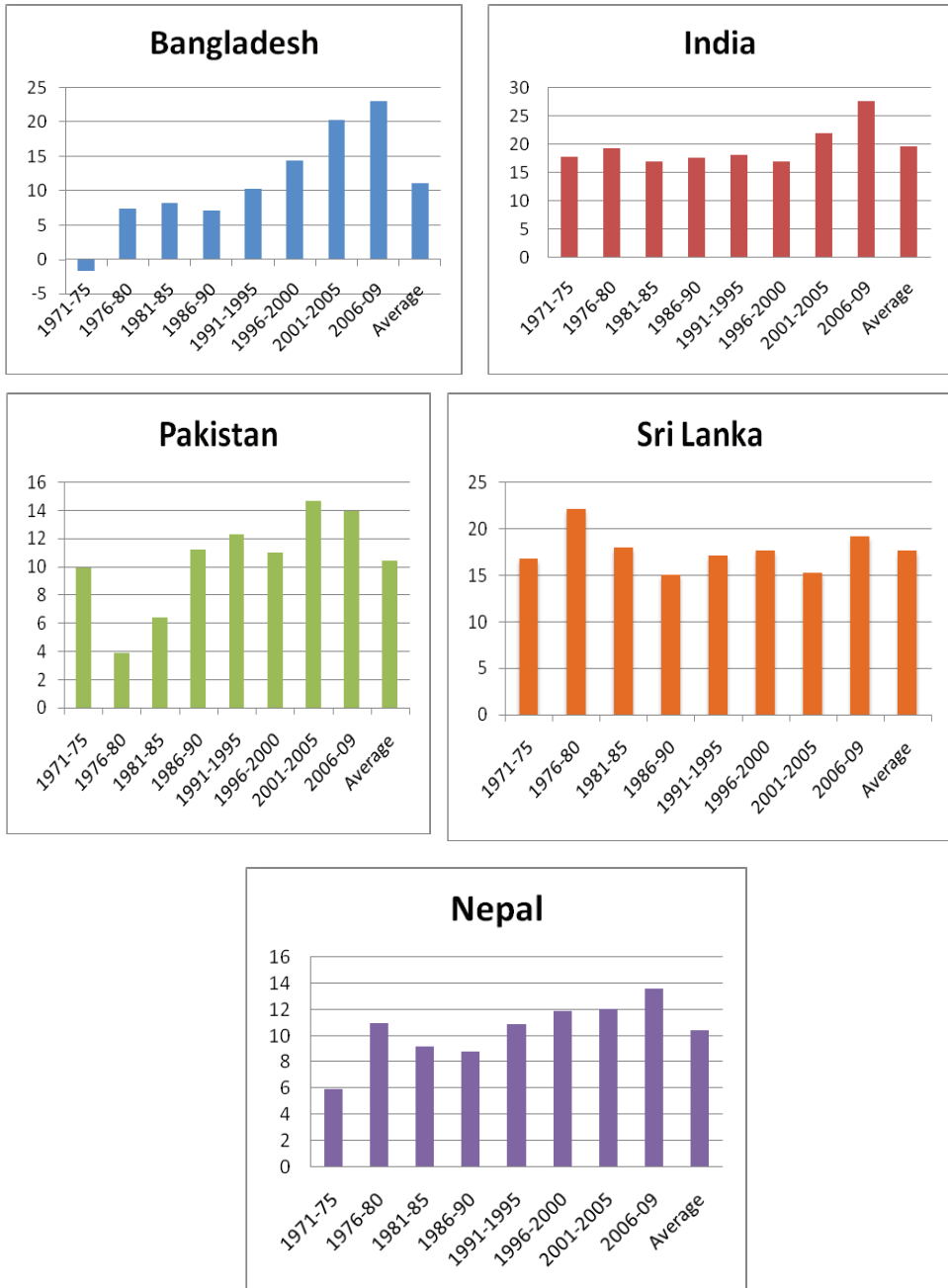
Country	1971-75	1976-80	1981-85	1986-90	1991-1995	1996-00	2001-05	2006-09	Average
Bangladesh	-1.76	7.37	8.27	7.17	10.21	14.34	20.28	23.03	11.11375
India	17.8	19.36	17.06	17.64	18.16	17.08	22.06	27.64	19.6
Pakistan	9.98	3.86	6.4	11.27	12.33	11.03	14.72	14.01	10.45
Nepal	5.93	10.96	9.19	8.85	10.86	11.94	12.05	13.64	10.4275
Sri Lanka	16.84	22.16	18.01	15.09	17.21	17.73	15.36	19.26	17.7075

Note: Saving is computed as  $100 - kc - kg$

Where,  $kc$  = consumption share of real GDP per capita &  $kg$  = government share of real GDP per capita

There are many factors that affected the trends of domestic savings rate for the selected countries. Almost all of the selected countries experienced rapid demographic transition, increased aged dependency and higher youth dependency.

**Figure: Domestic Saving Rates and its Past trends (1971-2009)**





## Section V

### ESTIMATION AND RESULTS

In this study, we estimated Ordinary Least Squares (OLS) which are shown in the model from 1 to 3 with no lag value, Country Fixed effects models which are shown in the model from 4 to 6 with no lag value and Random effects model which are shown in the model from 7 to 9 with no lag value. For estimating the model from 1 to 9, we used the non-overlapping data from 1971 to 2009.

We also included lag value for some variables such as lags of LPRGDP, SQLPRGDP, CREDIT, SQCREDIT and CHGDP because those variables are endogenous and using lagged values will alleviate simultaneity bias. We estimated Ordinary Least Square (OLS) which is shown in the model from 10 to 12 with lags of LPRGDP, SQLPRGDP, CREDIT, SQCREDIT and CHGDP, Country Fixed effects models which are shown in the model from 13 to 15 with lags of same variables used in model 10 to 12 and Random effects model which are shown in the model from 16 to 18 with lagged values used in the previous model.

To analyse our results for the model without lags which is shown in the model from 1 to 9, we see that in all cases, the value of the coefficient of aged dependency ratio (ADR) is negative and significant which is expected. In the model 1, the coefficient of ADR is -3.175678 which implies that as aged dependency rises by 1%, savings decreases by 3.175678%. Similarly, in the OLS at model 3, we see as aged dependency rises by 1%, savings decreases by 5.32942%. In the fixed effects model at model 4, we see as aged dependency rises by 1%, savings decreases by 4.70155%.

Similarly, the same decrease trends can be followed for the savings rate as aged dependency rises in the random effects model. The coefficient of youth dependency ratio (CDEP) also shows the expected result, which is negative values and in most of the cases it is significant. In the model 1, the coefficient of CDEP is -0.420784, which implies that as youth dependency ratio rises by 1%, savings decreases by 0.420784 %. Similarly, in the OLS at model 2, we see as youth dependency rises by 1%, savings decreases by 4.231233%. In the random effects model at model 8, we see as youth dependency rises by 1%, savings decreases by 0.431712%, except in the model 4-5. In all cases, the result is highly significant and expected.

Now, the coefficient of log of real per capita GDP (LPRGDP) is positive and significant in all cases (except model 4) which are also the expected result. If we explain these results, then we see that as log of real per capita GDP rises by 1%, then real domestic savings rate increases by 141.5597%, which is showed at the

model 1. Similarly the same significant result can be found in all the models.

In all of the cases in OLS, Fixed effects and Random effects Model, the coefficient value of SQLPRGDP showed in the model (except model 4) are significant, which indicate a nonlinear (concave) relationship with the domestic savings rate.

To describe the results of financial sector variables, the availability of CREDIT (ratio of private credit to GDP) showed negative value and in the four models out of nine, these are significant. In the model 3, it implies that, as CREDIT rises by 1%, real domestic savings rate decreases by 49%, because the financial sector of those sample countries have not developed enough. The coefficients of SQCREDIT showed positive values and in most of the cases, it is showing significant result.

If we turn to see the impact of growth rate of real per capita GDP (CHGDP) and Real interest rate (RINT), showing both result of coefficient is positive in all of the models (except model 8) and for the CHGDP, coefficient value in all the models are highly significant. But the coefficient of RINT is totally insignificant. The reason for that might be that interest rate starts to matter for savings behavior only after economic development has progressed beyond a certain threshold (see Ogaki, Ostry and Reinhart, 1996).

**Model 1-3: OLS<sup>1</sup> with no lags:**

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQCREDIT	CHGDP	RINT	R-Squared	#obs.
1	-3.175678*** (.4183629) 0.000	-0.420784*** (.0319277) 0.000	141.5597*** (43.78805) 0.001	-21.13122*** (7.012018) 0.003	-0.2538279 (12.60936) 0.984	5.976917 (23.74412) 0.802			0.6595	172
2	-4.231233*** (.415242) 0.000	-0.431712*** (.028917) 0.000	1362.605*** (202.2328) 0.000	-244.5785*** (36.84151) 0.000	-37.12686*** (12.8763) 0.004	54.58192** (22.87024) 0.018	0.0553618*** (.0089918) 0.000		0.7234	172
3	-5.32942*** (.53291) 0.000	-0.654061*** (.0710281) 0.000	1499.418*** (212.3528) 0.000	-272.322*** (38.73833) 0.000	-49.21689*** (11.84754) 0.000	67.99571*** (19.75128) 0.001	0.0645674*** (.009376) 0.000	0.0706452 (.0510681) 0.169	0.7825	116

Notes: First row for estimated coefficient, Second row for Standard errors and Third row for P-value

\*Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level.

**Model 4-6: Fixed effects model<sup>1</sup>: with no lags:**

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQCREDIT	CHGDP	RINT	R-Squared	#obs.
4	-3.70155*** (0.6148685) 0.000	-0.0306456 (0.071204) 0.667	-21.53853 (52.73669) 0.684	6.591666 (8.393473) 0.433	4.072597 (12.82984) 0.751	21.21908 (22.49187) 0.347			0.4095 0.0454 0.1890	172
5	-4.838489*** (0.6648831) 0.000	-0.1230668* (0.0728058) 0.093	893.3375*** (249.6396) 0.000	-159.3449*** (45.06315) 0.001	-23.11236* (14.31962) 0.108	48.68994** (22.84583) 0.035	0.0392058*** (0.0104748) 0.000		0.4571 0.3035 0.3983	172
6	-7.056929*** (0.8438236) 0.000	-0.4637949*** (0.1054798) 0.000	1316.348*** (252.2385) 0.000	-239.9493*** (45.82807) 0.000	-34.04233*** (12.2829) 0.007	59.23153*** (19.08664) 0.002	0.0611895*** (0.0110898) 0.000	0.0999215 (.0533501) 0.064	0.6244 0.3490 0.4737	116

\*Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level.

**Model 7-9: Random effects Model<sup>1</sup>: with no lags:**

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQCREDIT	CHGDP	RINT	R-Squared	#obs.
7	-3.175678*** (0.4183629) 0.000	-0.420784*** (0.0319277) 0.000	141.5597*** (43.78805) 0.001	-21.13122*** (7.012018) 0.003	-0.2538279 (12.60936) 0.984	5.976917 (23.74412) 0.801			0.3145 0.9947 0.6595	172
8	-4.231233*** (0.415242) 0.000	-0.431712*** (0.028917) 0.000	-244.5785*** (36.84151) 0.000	-37.12686*** (12.8763) 0.004	54.58192** (22.87024) 0.017	0.0553618*** (0.0089918) 0.000	-1863.145*** (281.7941) 0.000		0.3915 0.9835 0.7234	172
9	-5.32942*** (0.53291) 0.000	-0.654061*** (0.0710281) 0.000	1499.418*** (212.3528) 0.000	-272.322*** (38.73833) 0.000	-49.21689*** (11.84754) 0.000	67.99571*** (19.75128) 0.001	0.0645674*** (0.009376) 0.000	0.0706452 (0.0510681) 0.167	0.5557 0.9932 0.7825	116

Notes: First row for estimated coefficient, Second row for Standard errors and Third row for P-value

\*Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level.

The first R-squared is within, the second is between and the third is for overall

1=details of the model including data sources can be found in the appendix which we used in the analysis.

**Model 10-12: OLS<sup>1</sup> with lags of LPRGDP, SQLPRGDP, CREDIT, SQCREDIT and CHGDP:**

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQCREDIT	CHGDP	RINT	R-Squared	#obs.
10	-3.175678*** (0.4183629) 0.000	-0.420784*** (0.0319277) 0.000	141.5597*** (43.78805) 0.001	-21.13122*** (7.012018) 0.003	-0.2538279 (12.60936) 0.984	5.976917 (23.74412) 0.802			0.6595	172
11	-4.231233*** (0.415242) 0.000	-0.431712*** (0.028917) 0.000	1362.605*** (202.2328) 0.000	-244.5785*** (36.84151) 0.000	-37.12686*** (12.8763) 0.004	54.58192** (22.87024) 0.018	0.0553618*** (0.0089918) 0.000		0.7234	172
12	-5.32942*** (0.53291) 0.000	-0.654061*** (0.0710281) 0.000	1499.418*** (212.3528) 0.000	-272.322*** (38.73833) 0.000	-49.21689*** (11.84754) 0.000	67.99571*** (19.75128) 0.001	0.0645674*** (0.009376) 0.000	0.0706452 (0.0510681) 0.169	0.7825	116

**Model 13-16: Fixed effects model<sup>1</sup> with lags of LPRGDP, SQLPRGDP, CREDIT, SQCREDIT and CHGDP** (continued)

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQCREDIT	CHGDP	RINT	R-Squared	#obs.
13	-3.70155*** (0.6148685) 0.000	-0.0306456 (0.071204) 0.667	-21.53853 (52.73669) 0.684	6.591666 (8.393473) 0.433	4.072597 (12.82984) 0.751	21.21908 (22.49187) 0.347			0.4095 0.0454 0.1890	172
14	-4.838489*** (0.6648831) 0.000	-0.1230668* (0.0728058) 0.093	893.3375*** (249.6396) 0.000	-159.3449*** (45.06315) 0.001	-23.11236* (14.31962) 0.108	48.68994** (22.84583) 0.035	0.0392058*** (0.0104748) 0.000		0.4571 0.3035 0.3983	172
15	-7.056929*** (0.8438236) 0.000	-0.4637949*** (0.1054798) 0.000	1316.348*** (252.2385) 0.000	-239.9493*** (45.82807) 0.000	-34.04233*** (12.2829) 0.007	59.23153*** (19.08664) 0.002	0.0611895*** (0.010898) 0.000	0.0999215* (0.0533501) 0.064	0.6244 0.3490 0.4737	116

**Model 16-18: Random effects model<sup>1</sup> with lags of LPRGDP, SQLPRGDP, CREDIT, SQRCREDIT and CHGDP: (continued)**

Model	ADR	CDEP	LPRGDP	SQLPGDP	CREDIT	SQRCREDIT	CHGDP	RINT	R-Squared	#obs.
16	-3.175678*** (0.4183629) 0.000	-0.420784*** (0.0319277) 0.000	141.5597*** (43.78805) 0.001	-21.13122*** (7.012018) 0.003	-2538279 (12.60936) 0.984	5.976917 (23.74412) 0.801			0.3145 0.9947 0.6595	172
17	-4.231233*** (0.415242) 0.000	-0.431712*** (0.028917) 0.000	-244.5785*** (36.84151) 0.000	-37.12686*** (12.8763) 0.004	54.58192** 22.87024 0.017	0.0553618*** (0.0089918) 0.000	-1863.145*** (281.7941) 0.000		0.3915 0.9835 0.7234	172
18	-5.32942*** (0.53291) 0.000	-0.654061*** (0.0710281) 0.000	1499.418*** (212.3528) 0.000	-272.322*** 38.73833 0.000	-49.21689*** (11.84754) 0.000	67.99571*** (19.75128) 0.001	0.0645674*** (0.009376) 0.000	0.0706452 (0.0510681) 0.167	0.5557 0.9932 0.7825	116

Notes: First row for estimated coefficient, Second row for Standard errors and Third row for P-value

\*Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level.

The first R-squared is within, the second is between and the third is for overall

1=details of the model including data sources can be found in the appendix which we used in the analysis.

By analyzing the models with lags of LPRGDP, SQLPRGDP, CREDIT, SQCREDIT and CHGDP (models 10-18), we find the results are broadly consistent with the results for the model without lags. From the model 10 to 18, the coefficient of ADR showing negative value which is expected result and results are almost similar to the model without lags and in all of the cases, it is highly significant. The coefficient of CDEP is also negative and in the entire models with lags, it is highly significant and expected and results are almost similar to the model without lags.

The coefficient of log of real per capita GDP (LPRGDP) is positive and significant in all models (except model 13) which are very similar with the results without lagged values for the specific variables. In all of the models in OLS, Fixed effects and Random effects Model, the coefficient value of SQLPRGDP showed in the table (except model 13) are negative and significant which are similar with the models without lagged value.

Like the result of the models without lags of specific variables, the coefficient values with the lagged value are similar for CHGDP in the all models (model 10-18). In most of the cases, the values are positive and significant. But the coefficient of RINT is negative and those values are totally insignificant like the models without lagged variables. Similar result is found in both form with and without lagged variables values for CREDIT (ratio of private credit to GDP) which showed negative value in most of the models and in the four models out of nine, those values are significant.

In sum, we identified the main determinants of the domestic savings rate in the selected south Asian countries during the period 1971 to 2009 which are the aged structure of the population i.e age dependency ratio, youth dependency ratio, income levels and the level of financial sector development and the direction of impact of each factor is more or less as expected.

## **Section VI**

### **PROJECTION OF DOMESTIC SAVINGS RATE IN DEVELOPING ASIA FOR 2011-2030**

For the projections for such a long time period, we implicitly assume that there will be no changes in any factor. Structure of population projection for the next two decades, 2011-2020 and 2021-2030, is collected from the U.N projections of the age structure of the population.

**Table 15: Future Trends in Real Domestic Saving Rates in Selected South Asian Countries:**

Economy	2011-2020 Projected	2021-2030 Projected
Bangladesh	26.575	32.76
India	24.075	25.911
Pakistan	16.246	18.56
Nepal	14.695	16.396
Sri Lanka	16.555	16.119

Notes: calculated by using SPSS >'Transformation'

Savings rate projections are generated for 2011-2020 and 2021-2030 periods by using transformation tools of SPSS. By comparing and analyzing data of Table 1, which showed the past trends of real domestic savings rate with the Table 2, which shows Future Trends in Real Domestic Saving Rates in Selected South Asian Countries, we can see the trends of real domestic savings which are not so up trending because the positive savings rates are dominated by the negative impact of age structure of population. Comparison with the data for the period 2006-2009 in India shows saving rates of 27.64, but projected savings of India for the time period 2011-2020 show saving rate of 26.575. May the reason for such declines in savings will be from high rates of youth dependency ratio in the future for India.

**Table 16: Projection of Total Population by Country, 1950-2050 (thousands)**

Country	Bangladesh	India	Pakistan	Nepal	Sri Lanka
1950	37894.678	371856.5	37542.38	8230.991	8240.623
1955	43444.382	406374	41108.84	8941.972	8978.595
1960	50101.943	447844.2	45920.2	9740.462	10020.41
1965	57791.778	496400.4	51993.06	10707.31	11215.22
1970	66881.158	553873.9	59382.65	11917.87	12554.58
1975	70582.168	622096.7	68482.53	13373.07	13810.65
1980	80624.423	700058.6	80492.66	15045.33	15082.77
1985	92283.598	784490.8	95470.38	16936.01	16210.47
1990	105256.026	873785.4	111844.7	19081.06	17337.05
1995	117486.952	964486.2	127346.7	21594.87	18229.5
2000	129592.275	1053898	144522.2	24400.61	18745.08



2005	140587.922	1140043	158645.5	27281.95	19842.54
2010	148692.131	1224614	173593.4	29959.36	20859.95
2015	158316.614	1308221	189648.1	32580.61	21709.1
2020	167256.052	1386909	205364.5	35164.23	22343.62
2025	175194.618	1458958	220608.8	37653.24	22783.66
2030	181863.468	1523482	234432	39943.07	23094.47
2035	187102.9	1579802	246788.8	41976.6	23318.18
2040	190933.715	1627029	257777.9	43748.72	23432.92
2045	193344.384	1664519	267239.8	45257.29	23393.8
2050	194352.619	1692008	274875.4	46495.3	23192.81

Source: United Nations, Department of Economic and Social Affairs, Population Division

During the period 2011-2020, if others factor remain constant, Bangladesh, India, Pakistan and Nepal will experience decreasing trends of their savings rate, compared with the period 2006-2009, while Sri Lanka will experience high domestic savings rate for the same time period. But for the period 2021-2030, savings rate of Sri Lanka will decrease compared to previous decades. During the period 2021-2030, Bangladesh, India, Pakistan and Nepal may experience high real domestic saving rate where Bangladesh will have higher rate of savings compared with other countries. From the projection of population, we see that all the selected countries will experience high rates of population growth where Pakistan and Nepal will experience higher rate than the others during the time period 2011-2030.

## Section VII

### SUMMARY AND CONCLUSION

Based on the data for the period 1971-2009, we presented trends over time in domestic saving rates in Bangladesh, India, Pakistan, Sri Lanka and Nepal, conducted an econometric analysis of the determinants of those trends, and projected trends in domestic saving rates in the same economies during the next twenty years (2011-2030 period) based on our estimation results. We found that domestic saving rates in those developing Asian countries have, in general, been high and rising but that there have been substantial differences from economy to economy, that the main determinants of the domestic saving rate in developing Asia during these period appear to have been the age structure of the population (especially the aged dependency ratio, youth dependency ratio), income levels, and the level of financial sector development, and moreover, that the direction of impact of each factor has been more or less as expected. We also found that the domestic saving rates in those countries as a whole will remain roughly constant during the next two decades because the negative impact of population aging

thereon will be roughly offset by the positive impact of higher income levels thereon but there will be substantial variation from economy to economy, with the rapidly aging economies showing a sharp downturn in their domestic saving rates by 2030, because the negative impact of population aging thereon will dominate the positive impact of higher income levels and the less rapidly aging economies showing rising domestic saving rates because the positive impact of higher income levels thereon will dominate the negative impact of population aging.

Limitations:

- i) Our model may suffer from omitted variable bias.
- ii) If we would perform robust analysis, the study might be cause appealing.

Future Projection of Real domestic saving rates may misspell as we can't say exactly what will happen in future. We only can predict.

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