Growth and Public Expenditure Management: P-Value Analysis and Granger Causality in SAARC Economies

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Abstract

The Wagner Hypothesis (WH) is a concept that supposes that public expenditure is largely determined by the relative volume of the gross domestic product (GDP) and the size of the government (Wagner's law of expanding sate activity). It has been tested widely in a number of different territories. This proposition seems pertinent in the context of the South Asian Association for Regional Cooperation (SAARC) as this region has been flourishing with high growth and large public spending areas in the world, especially after the economic liberalization period starting in the mid-1980s. Major countries of this region annually spend on average more than 24 percent of their GDP on public spending, which is indicative of a high level of state activity. To explore this, WH has been tested to determine whether causality runs from GDP to public expenditure of the SAARC countries - Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka - by analysing GDP and government expenditure (GE) using data from 1985 to 2008. The econometric test results suggest that the WH is applicable to Bhutan, India, Nepal, Pakistan and Sri Lanka but there is no causation in the case of Bangladesh. This suggests several macroeconomic policy implications and need for rational policy adjustments, which are discussed in the context of the results.

Keywords: *econometric analysis, government expenditure, South Asian Association for Regional Cooperation, Wagner Hypothesis*

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1. Introduction

Gross Domestic Product (GDP), one of the measures of formal economic activities within a specific territory, is an outcome of several economic variables. Amongst these variables is public expenditure, which has an important impact on GDP accumulation and growth. The government sector normally builds and supports public utilities, builds socioeconomic infrastructure and incurs significant amount of expenditure for day-to-day running of the judiciary, legislative and administrative functions. By such consumption and investment activities, production (service and infrastructure) and income is generated in the economy. The relationship between GDP and government expenditure (GE) suggests that GDP would be a partial function of public expenditure. However, in contrast to this opinion, Adolph Wagner (1835-1917), a public finance theorist and advocate, suggested that as the size of the economy (or the government) grows bigger, public spending will also be affected accordingly. This proposition is examined in this paper for the South Asian Association for Regional Cooperation (SAARC), which consists of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. Evaluating the trend of government spending over time in the SAARC region reveals a regional average of GE/GDP ratio of more than 24 percent. In country specific terms, Bangladesh has the lowest rate 15 percent and Bhutan has the highest at 40 percent, when considered from 1985-2008. India and Nepal have 18 percent each and Pakistan and Sri Lanka have 25 percent and 28 percent respectively in the same period. The research questions to be answered include the extent to which these figures (GE and GDP) are causally related and what is the nature of any such relationship. To explore the issue, p-value analysis is employed.

The paper continues with a section briefly mentioning the different mathematical models that have been proposed previously and a literature survey of relevant work. The third section discusses the methodology employed and the model specification. The fourth section analyses the empirical findings for all the countries whose time series data has been used for testing WH. Finally, Section 5 summarizes, concludes and suggests policy measures and scope for further research.

2. Theoretical Models and Literature Survey

According to the functional relationship proposed by Adolph Wagner, GE is a partial function of GDP. This basic hypothesis has been proposed in six different basic models:

(a) *GE = f (GNP).*

(b) *GE/P = f (GNP/P).*

(c) *GC/GNP = f (GNP/P).*

(d) *GE = f (GNP/P).*

(e) *GE/GNP = f (GNP/P) and*

(f) *GE/GDP = f (GDP).*

Where, GE, P, GC and GNP represent government expenditure, price index, government consumption and gross national product and the symbol *f* in all equations signifies a functional relationship between the dependent variable and the explanatory variables.

Although there have been several models suggested and analysis may vary depending on specific research objectives, no unanimous findings have been obtained in the past. In essence, there have been basic three types of relationships found in prior research:

a. There was support in different studies for a GE-GDP relationship (WH) in which it was indicated that public expenditure was the function of output or growth such that as the size of the economy or the government grows, public expenditure also increases (Vatter and Walker (1986) for USA 1929-1979; Islam (2001) for USA 1929-1996; Gyles (1991) for UK 1946-1985; Nomura (1995) for Japan 1960-1991; Ahsan *et al*. (1996) for Canada 1952-1988; Dritsakis and Adamopoulos (2004) for Greece 1960-2001; Abizadeh and Yousefi (1998) for South Korea 1960-1990 and Dao (1995) for 55 countries 1980-1991).

b. There was no support for a GE-GDP relationship (WH), indicating that public expenditure was independent of growth of GDP (Legrenzi and Milas (2002) for Italy 1959-1996; Henrekson (1988) for Sweden 1861-1990; Halicioglu (2003) for Turkey 1960-2000; Burney (2002) for Kuwait 1969-1994; Wagner and Weber (1977) for 34 countries 1950-1972 and Lall (1969) for 46 developing countries 1962-1964).

c. Mixed results were also obtained showing support; no support; periodic support or inconclusive results concerning WH analysis (Abdel Rahman and Barry (1997) for Saudi Arabia 1970-1991; Ram (1987) for 115 countries 1950-1980; Bairam (1992) for OECD countries 1950-1985 and Payne and Ewing (1996) for 22 countries 1948-1994).

3. Model, Data and Methodology

The objective of this paper is to verify the causal relationship between GE and GDP in SAARC economies. The model employed in this paper is an econometric representation in line with the proposition:

$$GE = a + b\,GDP + e$$

Most of the macroeconomic time series data are believed to be non stationary at this level (Gujarati, 1995:729). Considering this generalization, applying standard regression models to non-stationary data series seems to be improper because any econometric analyses from which reasonable conclusions may be drawn must make sure that all the data series are of the same order of integration in order to avoid the problem of spurious relationships. Hence, to avoid such relationships and erroneous results with respect to the causal relationship between GE and GDP, an Augmented Dickey-Fuller (ADF)[1] unit root test is performed for GE and GDP included in the model based on the following regression equations:

$$\Delta GDP_t = \alpha_1 + \beta_1 GDP_{t-1} + \theta_1 \sum_{i=1}^{n} \Delta GDP_{t-i} + \varepsilon_{1t}$$

$$\Delta GE_t = \alpha_2 + \beta_2 GE_{t-1} + \theta_2 \sum_{i=1}^{n} \Delta GE_{t-j} + \varepsilon_{2t}$$

Where Δ is the first difference operator, t is the time trend, ε is the stationary random error and n is the maximum lag length. In both equations, the null hypothesis is that "GDP and GE have unit roots," that is, $\beta_1 = \beta_2 = 1$ hence non-stationary. The alternative hypothesis is that both variables are integrated of order zero, I (0), hence, stationary at levels. The null hypothesis that GDP and GE are non-stationary time series is rejected when both β_1 and β_2 are significantly negative and the *t* statistics are less than the MacKinnon critical values.

For further support to ADF test results, the Phillips-Perron (PP) test is also conducted as it gives more robust estimates compared to the ADF

[1] For details, see Gujarati (2003: 817-8).

test when the series has serial correlation. Hence, PP has also been employed in this analysis in addition to the conventional ADF test. The PP test finds the presence of a unit root in a series, say Y_t, by estimating following equations:

$$\Delta Y_t = \alpha + \rho^* Y_{t-1} + e_t$$

$$\Delta Y_t = \alpha + \beta t + \rho^* Y_{t-1} + e_t$$

Where, the second equation includes a trend variable. The PP test is the t-value associated with the estimated coefficient of ρ^*. The series is stationary if ρ^* is negative and not significant.

In this paper, a conventional Granger causality test has been performed to study the causal relationship between GE and GDP in SAARC countries. The conventional Granger causality test is assumed to be a reliable test for causality between two variables. It states that a variable *GDP* Granger-cause *GE* exists if the prediction of *GE* is improved solely by the past values of *GDP* and not by other series included in the analysis. Vice versa is also true for *GE* Granger-causing *GDP*. According to Granger (1969), if GE can be better explained on the basis of past GDP and past GE than on the basis of past GE alone, a causal relationship exists from GDP to public spending. Three other possible results are the cases of unilateral causality from GDP to public expenditure, bi-directional causality (or feedback) and independence. The procedure here is used to detect the causality between GE and GDP is defined[2] as follows:

$$GDP_t = \sum_{i=1}^{n} \alpha_i GE_{t-i} + \sum_{j=1}^{n} \beta_i GDP_{t-j} + u_{1t}$$

[2] For details, see Gujarati (2003: 697-701).

$$GE_t = \sum_{i=1}^{n} \lambda_i GE_{t-i} + \sum_{j=1}^{n} \delta_i GDP_{t-j} + u_{2t}$$

Where, GE is total government expenditure or, alternatively, public spending or public expenditure, GDP is gross domestic product and ε_1 and ε_2 are white-noise residuals. The null hypothesis to be tested here would be that 'GDP does not Granger cause GE.' The corresponding null hypothesis will be that 'GE does not Granger cause GDP.' If both the hypotheses are subject to rejection, then we can conclude that there is the presence of a feedback effect between *GE* and *GDP*. Further, if only one of the hypotheses is subject to rejection, it can be interpreted that there is unidirectional causality from that variable to the independent variable of the equation. In this process, co-integration of level series is considered so as to check the long run relationship amongst the variables. Through the residual stationary test, a long-run relationship is found between the variables concerned. This basis opens the ground for further testing of causality.

From the abovementioned Granger causality representations, it is apparent that:

(a) There is a unidirectional causality from GE to GDP if $\sum \alpha_i \neq 0$ and $\sum \delta_i = 0$.

(b) Quite the reverse, a unidirectional causality from GPP to GE will be found if $\sum \alpha_i = 0$ and $\sum \delta_i \neq 0$.

(c) There will be bi-directional causality or feedback between GDP and GE if both the conditions $\sum \delta_i \neq 0$ and $\sum \alpha_i \neq 0$ simultaneously hold; that is, the set of estimated coefficients of lagged *GDP* and lagged G*E* are significantly different from zero in both G*E* and *GDP* equations and

(d) GDP and GE will be determined independently and not statistically significant if $\sum \delta_i = 0$ and $\sum \alpha_i = 0$, implying that is there is no causal link between these two variables.

In this process, a dilemma may arise while selecting the appropriate lags of variables to include in the model. First, although the Granger causality test has a greater appeal than its alternatives, the issue concerning the optimal lag length still remains unclear. The distribution of a test statistic is sensitive to the order of lags used. If the lag order used is less than the true lag, the regression estimates would be biased and the residuals might be serially correlated. If the order of lags used exceeds the true lag order, the power of the test is likely to be reduced. In order to overcome such problems, it is possible to adopt the minimum final prediction error (FPE) criterion based on the Akaike Info Criterion (AIC) and the Schwartz Criterion (SC) and this approach has been taken here. The AIC is often used in model selection for non-nested alternatives where smaller values of the AIC are preferred. The SC is an alternative tool to the AIC that imposes a larger penalty for additional coefficients. The P-value approach has become a popular alternative these days to conclude a test of hypotheses. Under this method, the test compares the p-value of the sample test statistic with significance level (α) chosen.

The p-value of the test statistic is the smallest level of significance for which the null hypothesis (H_0) can be rejected. Most contemporary econometric and statistical software programmes report the p-value associated with the concerned sample statistic. The P-value further ensures that test results and interpretations lead to the right direction. The P-value should be explained very carefully, even though it is straightforward. It is compared to significance level α and, based upon this comparison, the null hypothesis is either rejected or not rejected. In general, there are four possible misinterpretations of the p-values:

(a) the probability that the null hypothesis is true;

(b) the probability of committing a Type – I error;

(c) the probability of making a wrong decision and

(d) the probability that the sample statistic is due to chance alone.

The general guideline for using the p-value is to derive the evidence against the null hypothesis is as follows:

P-value	Interpretations
$p \leq 0.01$	Very strong evidence against null hypothesis, i.e. result is highly significant
$0.01 < p < 0.05$	Strong evidence against null hypothesis, i.e. result is significant
$0.05 < p < 0.10$	Moderate evidence against null hypothesis, i.e. result is marginally significant
$p > 0.10$	Little or no evidence against null hypothesis, i.e. result is not significant

Table – 1: P-values and Their Contemporary Interpretations

The contemporary interpretations of p-values clarify and simplify the use of modern tools in research and pave the way for proper investigation and interpretation of the statistical and economic meanings of the findings. While converting the nominal data into real data for GE and GDP, the base years are set as 1996=100 for Bangladesh and Sri Lanka; 2001=100 for Bhutan, India and Nepal; and 2000=100 for Pakistan depending upon the several overlapping indexes of GDP deflators of the respective countries. Data is provided by the Asian Development Bank.

4. Analysis of Empirical Findings

The objective of this paper was to study the causal relationship between GE and GDP in SAARC countries. At the outset, correlograms were plotted for initial diagnostic checking to determine whether data are autocorrelated. Furthermore, the ADF and PP tests have been used to test the null hypothesis of unit root. The findings are explained below.

4.1. Stationary Test Results

Initial indications of correlograms plotted for the respective variables of all the respective countries included in the test indicated that the data have shown non-stationary trends in level and stationary trends at first differencing. The results of the ADF unit root and PP test statistic for GE and GDP of SAARC economies are reported in Table 2.

Countries	Data at	ADF Test Statistic		Phillips-Perron Test Statistic	
		GE	GDP	GE	GDP
Bangladesh	Level	2.3576	1.5920	2.9116	2.1841
	First Difference	-2.6248**	-5.3306***	-2.6155**	-5.3406***
Bhutan	Level	0.7028	3.5489	0.7028	3.4350
	First Difference	-4.6079***	-3.9641***	-4.6103***	-4.0106***
India	Level	2.8515	4.5822	2.9546	5.1285
	First Difference	-2.0125**	-2.6892**	-1.2168***	-2.6114**
Nepal	Level	0.3129	1.3439	0.8988	4.3089
	First Difference	-2.4971**	-4.5708***	-3.7531***	-5.0923***
Pakistan	Level	0.9654	2.9878	0.5832	3.4752
	First Difference	-2.8497***	-2.9551**	-2.8608**	-2.9551**
Sri Lanka	Level	2.9226	5.3126	1.5253	5.3126
	First Difference	-3.8875***	-2.2073*	-3.9258***	-2.0023*

Table 2: Unit Root Test Based on ADF and PP Test Statistics;[3] source: Original Research

[3] ***** *indicates significance level at 10% MacKinnon Critical Values, ** indicates significance level at 5% MacKinnon Critical Values and *** indicates significance level at 1% MacKinnon Critical Values.*

Since the computed ADF test statistic of all the variables are higher than any of these MacKinnon Critical values at level forms, the null hypothesis that these variables exhibit a unit root cannot be rejected in these SAARC countries. Owing to the presence of unit roots in all the time series, they are non-stationary, implying no statistically meaningful relationship between them. However, after first differencing, the null hypothesis of unit root is rejected in all of the cases since the ADF test statistic is smaller than McKinnon critical values. That is, the first differenced GDP and GE do not exhibit a unit root, meaning that these variables are stationary. Unit root test results on the basis of the ADF test indicate that all the series are integrated of order one or I (1). The null hypothesis of unit root could not be rejected for GDP and GE in the level form but could be rejected in their first differences for both the models.

Furthermore, the PP test checks the robustness of the ADF test. PP unit root also has a null hypothesis of unit root. Likewise, the results of the PP Unit Root statistic for GDP and GE of these South Asian nations are presented in the same table above. Since the computed PP test statistics of GDP and GE are higher than any of these MacKinnon Critical values at level forms, the null hypothesis that these variables exhibit a unit root cannot be rejected. The PP test does not reject the null hypothesis of unit root for GDP and GE in the level form and rejects the null hypothesis in the first difference form of the series. Owing to the presence of unit root in the variables, they are non-stationary, implying no statistically meaningful relationship between them. However, after first differencing, the null hypothesis of unit root is rejected in all of the cases since the PP test statistic is smaller than MacKinnon critical values. That is, the first differenced GDP and GE do not exhibit a unit root, meaning that these variables of all the six countries are stationary. Hence, both ADF and PP tests have similar indications that all the variables have unit root in level forms and no unit root in the first difference.

4.2. Granger Causality Test

The AIC and SC values for the selection of optimal lag have been presented in Appendix 1. The Appendix shows that the minimum value of AIC and SC for both variables is found at first lag for all six countries included in the study. Hence, the first lag has been selected as the optimal lag for all these countries to proceed further for the Granger causality test. This paper has employed the technique of bivariate pair-wise Granger causality testing to examine the causal relationship between GE and GDP. The Granger causality results presented in Table 3 are obtained by using first lag as optimum lag length for each variable.

According to the values presented in Table 3 for pair-wise Granger causality tests, p-values have indicated mixed possibilities. In country specific terms, the results for Bhutan, India, Nepal, Pakistan and Sri Lanka show that the null hypothesis that "GDP does not Granger cause GE" is rejected in different level of significance. The p-values are highly significant and produced very strong evidence against the null hypothesis at 1% level in the case of Bhutan and Sri Lanka. In relation to Nepal, the p-value is significant at the 5% level and this suggests strong evidence against the null hypothesis. For India and Pakistan, the p-values support moderate evidence against the null hypothesis at the 10% level of significance, implying that the results are marginally significant. In contrast, p-value is > 0.10 in the case of Bangladesh, indicating little or no evidence against the null hypothesis and the result is non-significant. These patterns of results suggest that there is unidirectional causality running from GDP to GE in Bhutan, India, Nepal, Pakistan and Sri Lanka, so that GDP is one of the sources of variation of GE in those countries. However, in the same test, the results for Bangladesh are different. The results suggest that there is no causal relationship between GDP and GE in Bangladesh.

Country	Null Hypothesis	Obs	Lag	F - Stat	P-Values[4]	Decision
Bangladesh	GDP does not Granger Cause GE	23	1	2.7830	0.1108	Do not Reject
	GE does not Granger Cause GDP			2.93100	0.1023	Do not Reject
Bhutan	GDP does not Granger Cause GE	23	1	13.1023	0.0017***	Reject
	GE does not Granger Cause GDP			1.2687	0.2733	Do not Reject
India	GDP does not Granger Cause GE	23	1	4.2400	0.0527*	Reject
	GE does not Granger Cause GDP			0.0119	0.9140	Do not Reject
Nepal	GDP does not Granger Cause GE	23	1	7.7904	0.0112**	Reject
	GE does not Granger Cause GDP			0.2599	0.6157	Do not Reject
Pakistan	GDP does not Granger Cause GE	23	1	4.0129	0.0588*	Reject
	GE does not Granger Cause GDP			1.8699	0.1866	Do not Reject
Sri Lanka	GDP does not Granger Cause GE	23	1	12.4263	0.0021***	Reject
	GE does not Granger Cause GDP			0.28001	0.6025	Do not Reject

Table 3: Pair-Wise Granger Causality Results

[4] * p-value <0.01 (significant at 0.01), ** p-value <0.05 (significant at 0.05), and *** p-value <0.10 (significant at 0.10)

4.3. Views on Locality, Model Formulation and Findings

Researchers face several limitations in their work and may observe discrepancies in results due to contemporary practices of model verification and hypothesis testing because of exclusion of internal factors in the models that might have specific influences. In this paper too, regarding the analysis of relationship between GDP and GE, the countries included are of different sizes in terms of geographic area, population, growth pattern, socio-economic diversity, level of development and political set-up. For example, the populations of Bhutan, Sri Lanka and Nepal are significantly lower than India and Pakistan. Furthermore, the transparency and literacy of the government in public spending would also have an impact on expenditure patterns. For example, if the government concerned is populist and democratically accountable, then the spending tendency would be higher in development sectors, whereas if the country is ruled by military junta or there are concerns about national security, then spending might be more focused on defence. Pakistan and India dedicate a higher proportion of their budgets on defence than do Bhutan and the Maldives. The efficiency of national resource use by the government can be increased through greater transparency, accountability and integrity (Transparency International, 2010). The results of the present study indicated unidirectional causality from GDP to GE in Bhutan, India, Nepal, Pakistan and Sri Lanka and no causality in Bangladesh. Such discrepancies of results amongst countries might have been influenced by these factors.

However, despite the several possible influences of locality, transparency and ideology regarding public spending, the belief can be held that the ultimate transmission channel of the government expenditure is: (a) based on consumption elasticity thereby boosting backward and forward linkages between primary, secondary and tertiary sectors of the economy, (b) capital-spending elasticity, thereby promoting accumulation of capital wealth and socio-economic infrastructure or (c) combined consumption and capital spending in the development process.

5. Conclusion, Recommendation and Scope

Government spending incurred by the concerned countries is a matter of choice of those countries depending upon resource availability, national fiscal policy, size of the economy, level of national socio-economic development and other sectoral policies (trade, monetary, poverty alleviation, defence etc). In the SAARC Region, amongst the countries included in the study, all of the countries' data series except Bangladesh supported WH, i.e. as the size of the government or economy increases, GE also increases. Hence, respective authorities of the countries can take the findings as reference material while formulating their fiscal policies and trade policies according to their socio-economic condition and financial needs. One important observation to mention here is that Bhutan, India, Nepal, Pakistan and Sri Lanka have their GE/GDP ratio over 18 percent whereas in Bangladesh it is only 15 percent. Furthermore, India and Nepal, with 18 percent GE/GDP ratio rejected the null hypothesis "GDP does not Granger Cause GE" at 10 percent and 5 percent level of significance respectively, whereas Bhutan, and Sri Lanka, having more than 25 percent of GE/GDP ratio, rejected the same null hypothesis at 1 percent level and Pakistan, having GE/GDP ratio of 25 percent, rejected the same at 10 percent. It may be, then, that the WH might work effectively only if the level of public spending crosses a certain limit of threshold of GE/GDP ratio. This possibility can further be tested by broader coverage and longer periods of time series data. Similarly, the WH can be explored further and reinforced by advanced methods of testing like intervention analysis (impulse response function and variance decomposition), spectral analysis and inclusion of influences of locality, all of which was beyond the scope of this paper.

6. References

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Appendix 1: Selection of Optimal Lag Length

Countries	Dependent Variable	Respective Lags	AIC	SC
Bangladesh	GE	1	*1.1195*	*1.1686*
		2	2.5123	2.5614
		3	3.3297	3.3788
	GDP	1	*0.9298*	*0.9788*
		2	2.3171	2.3661
		3	3.1289	3.1780
Bhutan	GE	1	*0.9024*	*0.9515*
		2	2.2889	2.3381
		3	3.1001	3.1489
	GDP	1	*1.1732*	*1.2228*
		2	2.5595	2.6086
		3	3.3706	3.4195
India	GE	1	*1.0623*	*1.1114*
		2	2.4492	2.4982
		3	3.2607	3.3098
	GDP	1	*1.9096*	*1.1587*
		2	2.4980	2.5951
		3	3.3090	3.3561
Nepal	GE	1	*0.3188*	*0.3679*
		2	1.7051	1.7542
		3	2.5161	2.5651
	GDP	1	*0.5082*	*0.5572*
		2	1.8944	1.9435
		3	2.7054	2.7545
Pakistan	GE	1	*-0.1822*	*-0.1331*
		2	1.2066	1.2557
		3	2.0201	2.0691
	GDP	1	*0.3692*	*0.4453*
		2	1.7831	1.8322
		3	2.5946	2.6437
Sri Lanka	GE	1	*0.0276*	*0.0767*
		2	1.4139	1.4630
		3	2.2249	2.2739
	GDP	1	*0.7158*	*0.7648*
		2	2.1020	2.1511
		3	2.9130	2.9621

Note: *AIC and SC were calculated up to six lag, however the values are reported for only up to three lags because of space constraints.*

Appendix 2: Government Expenditure and GDP Pattern in the SAARC Countries[5]

Countries	Bangladesh		Bhutan		India		Nepal		Pakistan		Sri Lanka	
Years	GDP	GE/GDP	GDP	GE/GDP	GDP	GE/GDP	GDP	GE/GDP	GDP	GE/GDP	GDP	GE/GDP
1985	763	15	8.2	52	7357	18	190.6	18	1962	25	415.2	34
1986	797	15	9.0	44	7685	20	199.4	17	2073	26	429.0	33
1987	827	14	10.6	43	8026	19	202.8	17	2207	27	439.1	33
1988	921	15	10.7	45	8885	19	218.4	18	2371	27	455.8	32
1989	872	16	11.2	49	9506	19	227.7	20	2491	26	471.9	31
1990	1283	12	12.0	36	10797	19	255.6	18	2311	29	503.8	29
1991	1337	11	12.3	33	10943	18	273.7	18	2441	29	528.2	29
1992	1391	13	12.8	35	11531	17	285.3	16	2618	30	547.7	27
1993	1456	13	13.1	35	12206	17	295.7	17	2679	29	592.8	27
1994	1515	15	13.8	35	12958	16	320.9	16	2785	26	628.2	27
1995	1590	14	14.7	38	13906	16	331.8	17	2923	26	662.4	30
1996	1663	14	15.5	38	15044	15	349.1	17	3118	27	688.1	28
1997	1753	13	16.2	35	15716	15	366.8	17	3141	24	731.6	26
1998	1845	13	17.2	30	16782	16	378.8	17	3252	26	791.6	24
1999	1934	14	18.5	41	17865	17	395.2	16	3386	24	824.8	24
2000	2049	15	20.1	41	18599	17	418.9	16	3562	20	874.5	25
2001	2158	15	21.5	47	19660	17	441.5	18	3636	19	866.9	26
2002	2252	15	23.8	37	20428	18	442.2	17	3745	20	912.5	24
2003	2371	15	25.5	34	22148	19	459.6	15	3922	20	967.3	22
2004	2521	15	27.3	30	23783	17	481.8	15	4214	18	1016.8	23
2005	2669	15	29.1	35	26030	15	499.5	15	4593	18	1080.4	24
2006	2845	15	30.9	33	28567	15	518.3	15	4859	20	1162.8	24
2007	3029	14	37.5	29	31130	16	537.4	16	5179	22	1242.0	23
2008	3216	17	39.0	35	33468	18	560.5	17	5359	24	1315.6	22
GE/GDP		15		40		18		18		25		28
Six Country Average (GE/GDP Ratio)												24

Note: Unit of Measurement for GDP Values of the respective countries:

Bangladesh (Taka in billions); Bhutan (Ngultrum in billions); India, Nepal, Pakistan and Sri Lanka (Rupees in billions of respective countries' currencies).

[5] Share in percent of GDP of the respective countries by respective years in real price.