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Government Revenues and Government Expenditures, or Fiscal Synchronization: Empirical Evidence from South and Eastern Asia

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ABSTRACT

To understand and solve budget deficit problems, some academics propose budget cuts while some suggest increase in taxes. The purpose of this study is to check the causal relationship among ten countries from two regions, south and eastern Asia, where all countries are developing except, Japan. The relationship is tested among three fiscal variables for the period of twenty-seven years from 1980 to 2017. For analysis purposes, Augmented Dickey Fuller test, Toda and Yamamoto Granger Causality Test and Johnson co-integration tests has been used. The results reveal three co-integrating effects for, Bangladesh and Mongolia, two for India and Japan, one for Sri Lanka, Nepal, China, South Korea, North Korea, while non for Pakistan. The Toda and Yamamoto Granger causality tests reveal evidence of tax-and-spend hypothesis for China, Pakistan, and Nepal. For Nepal, we found support for spend-and-tax hypothesis. There is evidence of neutrality for Japan, South Korea, North Korea, Mongolia, India, Sri Lanka, and Bangladesh. The results validate that south and eastern Asian countries tax policies have lesser impact to reduce budget deficits and do not offer permanent solution for fiscal problems. Our findings support increase in taxes may be a good solution to budget deficit problem, but it can be reduced if revenues and expenditures are controlled simultaneously. Major policy implications include, raising tax rates in nations like China, Pakistan, and Nepal, to increase revenue and strengthen fiscal sustainability, the significance of government spending reduction as a key tactic for managing budget imbalances, the importance of balancing both revenue generation and expenditure and flexibility in approach and continual monitoring of fiscal indicators.



KEYWORDS

budget deficits; government revenues; government expenditures; fiscal synchronization; Johnson Co-integration; South and Eastern Asia

JEL C32; E62; H20; H50

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Государственные доходы и государственные расходы, или фискальная синхронизация: эмпирические данные из Южной и Восточной Азии

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АННОТАЦИЯ

Чтобы понять и решить проблемы бюджетного дефицита, некоторые ученые предлагают сократить бюджеты, а некоторые предлагают увеличить налоги. Целью данного исследования является проверка причинно-следственной связи

между десятью странами из двух регионов, Южной и Восточной Азии, где все страны развиваются, за исключением Японии. Связь тестируется между тремя финансовыми переменными за период в 27 лет с 1980 по 2017 г. Для целей анализа использовались расширенный тест Дики Фуллера, тест причинности Тоды и Ямамото Грейнджера и тесты коинтеграции Джонсона. Результаты выявили три коинтеграционных эффекта для Бангладеш и Монголии, два – для Индии и Японии, один – для Шри Ланки, Непала, Китая, Северной Кореи, Южной Кореи. Для Пакистана не было выявлено эффектов. Тесты причинно-следственной связи Тоды и Ямамото Грейнджера подтверждают гипотезу «налоги и расходы» для Китая, Пакистана и Непала. В Непале мы нашли поддержку гипотезы расходов и налогов. Имеются свидетельства нейтралитета Японии, Северной Кореи, Южной Кореи, Монголии, Индии, Шри Ланки и Бангладеш. Результаты подтверждают, что налоговая политика стран Южной и Восточной Азии оказывает меньшее влияние на сокращение бюджетного дефицита и не предлагает постоянного решения финансовых проблем. Наши результаты подтверждают, что повышение налогов может быть хорошим решением проблемы бюджетного дефицита, но его можно уменьшить, если доходы и расходы контролируются одновременно. Основные последствия для политики включают повышение налоговых ставок в таких странах, как Китай, Пакистан и Непал, для увеличения доходов и укрепления финансовой устойчивости, важность сокращения государственных расходов как ключевой тактики управления бюджетными дисбалансами, важность балансирования доходов и расходов, и гибкость в подходе и постоянный мониторинг бюджетных показателей.

КЛЮЧЕВЫЕ СЛОВА

дефицит бюджета; государственные доходы; государственные расходы; фискальная синхронизация; коинтеграция Джонсона; Южная и Восточная Азия

1. Introduction

Budget deficits cause problems for governments both in developed and developing worlds. These deficits pressurize governments to increase interest rates and ultimately capital formation become slower.

In last few decades many empirical studies examined deficit problems in the developing world. Numerous academia suggest cut in government expenditures (GE) to overcome deficits and believe rising taxes will simply cause high expenditures (Friedman [1]), the causal relationship between government revenues (GR) and GE is not easy to understand and considering one component and ignoring the other can negatively affect deficit solution. First, government revenues cause expenditures, second, expenditures cause revenues, Third, and both occurred concurrently (Joulfaian & Mookerjee [2]).

The causal relationship between GR and GE is of greater importance for government authorities to understand and to quantify its sources.

These hypothesis present theoretical and empirical implications, on the theo-

retical side the Tax (revenue)-spend (expenditures) hypothesis examine that higher revenue leads to higher government expenditures (Nwosu & Okafor [3]). The estimated causal relationship would be in the same direction running from GR to GE.

The spend-and-tax hypothesis holds that deficits cause governments to raise taxes to match its spending, this increase upholds by government and remain a permanent raise in taxes, ultimately expected causal relationship is unidirectional from expenditure to revenues.

Third hypothesis, fiscal synchronization which holds that governments spending budgets on projects are determined by revenue sources and may change bidirectional (Gounder et al. [4]).

The debate among academia has been increased in recent past with increasing trends in government budgets deficits both in developing and developed world. On the policy implication side, if the revenue causes expenditures, then government can eliminate deficits by increasing revenues. Second, if governments spend first and finance program later that will unbalance the pattern and will cause a perma-

ment shift in government taxes (Peacock & Wiseman [5]). Third, if governments avoid fiscal synchronization, then government expenditures will increase at higher phase than revenues (Nzimande & Ngalawa [6]).

The purpose of this study is to check the causal relationship among ten countries¹ from two regions, South and Eastern Asia, where all countries are developing except, Japan and among them eight are facing budget deficits.

This study tests the *following hypothesis*:

H1: Tax and Spend Hypothesis: raising tax leading to more expenditure in south and eastern Asia.

H2: Spend and Tax Hypothesis: government expenditures causing revenue in south and eastern Asia.

H3: Fiscal Synchronization Hypothesis: government may change taxes and expenditures simultaneously in south and eastern Asia.

The contribution of this work are as follows. First, in this study we analyzed annual data for twenty-seven years and for ten countries, the data possess structural changes and important to examine (Payne et al. [7]). Second, in the literature no study was found on these two regions of the world which examined comprehensive measures of GR and GE. Third, most of the countries included in this study are newly industrialized and are not examined for causal relationship among the interest variables.

The rest of the paper is organized as follow. Section two presents the theoretical and empirical literature. Section three presents' data source variable measurements, and methodology. Section four estimates the key findings and discussions. Section five conclude the paper with policy implications for stakeholders.

2. Literature Review

The causal relationships between Government Revenues and Government Expenditures are topic of great discussion in the last five decades. The causal rela-

tionships between GR and GE to budgets deficit have not been resolved empirically (Febriani & Rambe [8]).

Theoretically, volume of studies in the developed and developing world appeared to examine its importance. The implications of revenues and expenditures have been emphasized by (Chen & Xu [9]). Irrespective of their relationships the policy implication of these findings is significant.

The tax-and-spend hypothesis was presented by Babarinde [10], stated that rising taxes will simply give government an opportunity to spend more on projects, but it would not reduce government budget deficits. Public rule ensures government spend what is received in form of taxes and at the same time reducing taxes can lead higher budgets deficits (Shkarlet et al. [11]), because GE are increases with taxes. To reduce the budgets deficits the government should reduce its spending.

The tax led government expenditure hypothesis were also examined by Arvin et al. [12]. They stated that with a cut in taxes lead to reduction in the cost of government programs. This induce pressure on new programs, which results in higher budget deficits and can be realized of reduction in tax revenue and government spending.

The spend-and-tax hypothesis explain that expenditures cause revenue (Chang & Ho [13]). They stated crisis situations brings permanent changes in expenditure pattern of governments. Initial crisis increase government expenditure more in proportion to increase in taxes, this brings continuous changes in fiscal variables initially justify by crises situation become public permanent tax policy, hence government will have no choice but to increase the taxes to match its spending (Brady & Magazzino [14]).

Fiscal Synchronization hypothesis holds that government may change expenditures and revenue at the same time (Akram & Rath [15]). It means government revenue decisions are not made in absence of expenditures, and the causality remains bidirectional, under this belief

¹ Ten countries from two regions; from Asia; India, Pakistan, Bangladesh, Sri Lanka and from Eastern Asia; Mongolia, China, South Korea, North Korea, Japan.

government brings down expenditures with a belief it will bring increase in taxes in the future.

The empirical literature on the causal relationship between GR and GE both in the developed and developing world are discussed in the country scenario.

Owoye [16] by using co-integration and ECM Models reported bidirectional causality for G7 countries except Italy and Japan by using data from 1960–1990.

Raza et al. [17] found a non-linear causal relationship between GR and GE in Pakistan for a period of (1972–2014). The authors reported a co-integration among GR and GE and fiscal synchronization in the government budget process.

Yashobanta & Behera [18] estimates the causal relationship between GR and GE in India from 1970–2008 by using VECM, they reported a bidirectional causal relationship between GR and GE in the long run while unidirectional in the short run. The long run relationship validates the hypothesis of fiscal synchronization and short run spend and tax hypothesis for India.

Ikhsan & Virananda [19] used data of GR and GE from 1973 to 2009 for Sri Lanka, by using VAR model, they found evidence of spend and tax hypothesis. By using bond testing approach has reported tax and spend hypothesis for Singapore, Sri Lanka, and Indonesia in short run, the same were found for Nepal both in long run and short run. The spend-and-tax hypothesis were found for Indonesia and Sri Lanka in Long run. For the remaining countries, Philippines, Pakistan, India, Thailand, and Singapore neutrality have reported.

Hong [20] employed ECM and Johnson co-integration and used annual time series data from 1970 to 2007 in Malaysia. The researcher found co-integration between GE and GR. They found a unidirectional causal relationship from GE to GR.

Sanusi [21] examined the causal relationship between government expenditure and government revenues by using quarterly data from 1965–2019. He used linear and nonlinear models. The empirical findings suggests that non-linear and

one-way causal relationship among the study GE and GR.

Guru-Gharana et al. [22] by using Toda and Yamamoto methodology examined the spending and revenues pattern of Greece and found causal unidirectional relationship from GR towards GE.

Narayan [23] by using Toda and Yamamoto approach estimate the relationship between GR and GE for twelve developing countries and found spend and tax hypothesis for Haiti and support for tax and spend hypothesis for Venezuela, Chile, Haiti, El Salvador, and Mauritius. Neutrality was reported for Ecuador, Uruguay, Guatemala, South Africa, and Peru.

Chang et al. [24] estimate the relationship between GR and GE for ten industrialized countries (United Kingdom, Japan, Canada, Thailand, Taiwan, New Zealand, South Korea, USA, Australia, and South Africa). The co-integration among GR and GE were reported for seven countries (United Kingdom, Australia, South Africa, Taiwan, Japan, USA, and South Korea). Causality results reveals a unidirectional relationship from government revenues to expenditures for, Japan, Taiwan, South Korea, UK, and USA. The same unidirectional causal relationship running from GR and GE was found for South Africa and Australia.

Afonso & Rault [25] estimates the causal relationship between government revenue and government spending in the European Union countries from 1960 to 2006. Their empirical results shows that selected EU countries have different pattern of tax collections and spending. The GE to GR was found for Italy and France, while GR to GE were reported for Germany, Austria, and Belgium.

Magazzino [26] investigated the causal relationship between government revenue and government expenditure in six West African countries. The results reveal that causality running from revenue to expenditure in Liberia, Sierra Leone, Gambia, and Nigeria while no causal relationship was found for the remaining two countries.

No two studies in the academic literature predicts the same causal relationship

among government revenues and Government expenditures while many papers contradict previous studies. This study is an attempt to increase the understandings of academia in relation to GR and GE in newly industrialized countries of south and eastern Asian countries.

3. Methodology

3.1. Data Source and Variables Calculations

Yearly data of main variables were collected of ten countries from Asia and Eastern Asian countries from 1980–2017 from Chinese Stock Exchange and Accounting Research Database (CSMAR). It has the main data source of Chinese listed firms. Table 1 gives details of variables calculations. All the variables are calculated at current and constant prices.

Total revenues and total expenditures are classified into, revenue and capital receipt, and revenue and capital expenditures. The revenue receipt is non-redeemable, or revenue titled with no future obligations while capital receipt is those creating liability and will decrease state assets in the future. Revenue expenditures include spending on state department’s responsible and did not create physical assets while capital expenditures are direct expenditures on serving debts or spending social developments.

3.2. Unit Root tests

To check the causal associations of interest variables, the time series of variables are tested for stationarity. The Augmented

Dickey Fuller are carried out to check weather series have unit root or not? If the data are having unit root, it is non-stationary, and do not have unit root and series is considered stationary. In this paper we have used auto regressive equation proposed by Luković & Grbić [27].

$$\Delta Y_{\tau} = \alpha_0 + \alpha_1 \tau + \alpha_2 Y_{\tau-1} + \sum_{i=1}^n \delta_i Y_{\tau-i} + \omega_{\tau}, \tag{1}$$

where Y_{τ} are the observed variables GR_{τ} and GE_{τ} , $\alpha_0, \alpha_1, \alpha_2, \delta_i$ are the set of parameters which are estimated, and ω_{τ} a white noise error.

3.3. Toda and Yamamoto Test (TYT)

TYT is the Causality test to examine the causal relationship among two variables.

Granger [28] and Johansen & Juselius [29] proposed various causality tests to quantify the cause-and-effect relationship between two variables affecting each other with distributed legs. Granger Causality test is useful when we are interested in direction of causality not on magnitude of impact.

In this study we used robust granger causality test of Toda and Yamamoto [31]. This method has the flexibility of asymptotic chi-squared distribution. The causality test are carried conventionally by estimating Vector Autoregressive (VAR) models (Engle & Granger [30]).

For joint significance of variables Granger non-causality test recommends Wald F-test in unrestricted vector autoregressive (VAR) models. When time series

Table 1

Measurements		
Variables	Abbreviation	Measures
Real Gross Domestic Product	RGDP	Total sum of goods and services produced valued at pre-determined market prices
Government Revenues	GR	Primarily Industry + Secondary Industry + Industry + construction + wholesale, retail and catering trade + transportations, storage, post and telecommunication + other sectors
Government Expenditures	GE	Final consumption expenditures + household consumption expenditures + General government consumption expenditures + Gross capital formation+ gross fixed capital formation

data are co-integrated then Wald F-test is not valid for granger non-causality, because it lacks standard distribution (Toda & Yamamoto [31]).

They further proposed modified Wald test to restrict parameters of VAR model. Two steps are involved to run this method, first, determination of optimal lag length (S) and maximum order of integration (dmax) of variables are used in the model.

In this paper Akaike information criterion is used to determine optimal lag length (S) and ADF unit root test or maximum order of integration (dmax). Once VAR (S) and dmax are obtained then VAR optimal lag length ($p = s + dmax$) at level will be estimated. Second, Wald test on the (S) coefficients matrix to draw inferences on Granger Causality. The above discussion is explained in the following equations:

$$\begin{aligned} \ln Y_{\tau} = & \sigma_0 + \sum_{l=1}^{s+dmax} \omega_l \ln Y_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \partial_l \ln GR_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \gamma_l \ln GE_{\tau-l} + \varepsilon_{1\tau}; \end{aligned} \tag{2}$$

$$\begin{aligned} \ln GR_{\tau} = & \alpha_0 + \sum_{l=1}^{s+dmax} \alpha_l \ln GR_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \beta_l \ln GE_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \pi_l \ln Y_{\tau-l} + \varepsilon_{2\tau}; \end{aligned} \tag{3}$$

$$\begin{aligned} \ln GE_{\tau} = & \theta_0 + \sum_{l=1}^{s+dmax} \delta_l \ln GE_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \varphi_l \ln GR_{\tau-l} + \\ & + \sum_{l=1}^{s+dmax} \tau_l \ln Y_{\tau-l} + \varepsilon_{3\tau}. \end{aligned} \tag{4}$$

Ln GR is calculated by taking natural logarithm of government revenues and ln GE natural logarithm of government Expenditures. Ln Y is the natural logarithm of real gross domestic product

(GDP). $\varepsilon_{1\tau}$, $\varepsilon_{2\tau}$ and $\varepsilon_{3\tau}$ are independent random errors having zero mean values and finite covariance matrix (Narayan & Narayan [32]).

4. Results of Stationarity and Co-integration

Table 2 show the augmented dickey fuller test results and p-value of each variable against null hypothesis. It was found that GDP, GR, and GE are non-stationary at level. All the three variables are stationary at order I (1) except China and Bangladesh which are stationary at I (2).

The null hypothesis is rejected and there is absence of unit root among interest variables, concludes stationarity of time series (Table 3).

The co-integrations result in Table 3 reveal that except Pakistan, all nine countries of South and Eastern Asia, Gross Domestic Product, government revenues and expenditures are co-integrated.

5. Discussion

As we were interested to check the causality among revenue and expenditures. Engle & Granger [28] and Johansen & Juselius [29] are not free of limitations, the pre-requests' include, unit root test and co-integration but sensitive to model specifications.

To overcome these limitations, we employ more robust causality test presented by Toda & Yamamoto [31]. Some caution is required while interpreting the causal relationships among three variables because in budget financing near elections, government officials in spite of tax financing switch to debt financing or deliberately lower taxes on goods to secure maximum number of seats (Hasan & Lincoln [33]).

Table 4 presents the results of Toda and Yamamoto Granger Causality of ten countries.

All three hypothesis were found in the selected countries and are accepted.

The results reveal that a unidirectional casualty is running from GR to GE for China, Pakistan, and Nepal. Similar results were reported by Park [34], Raza et al. [17], Hong [20], Yashobanta & Behera [18], Ikh-

san & Virananda [19], who examined causality run from GR to GE.

For Nepal the casualty run from GE to GR and validate the hypothesis of spend and tax hypothesis. Owoye [16] reported GE causes GR in G7 countries, Ghartey [35] found the same relationship for the developing countries. For remaining countries North Korea, South Korea, Mongolia, India, Bangladesh, and Sri Lanka there is no causal relation among government revenues and expenditures and hence exists neutrality GR and GE, it means GR and GE decisions are made in-

dependently. Our results are in line with findings of Narayan & Naraya, [32] in his work he reported neutrality in five out of nine countries included India.

For causal relationship between GDP and GR and GE, we found, bidirectional casualty between GDP and GE for China, North Korea, and Nepal, and a unidirectional casualty between GDP and GE for Sri Lanka. Same bidirectional casualty was found between GDP and GR for India, and unidirectional casualty were found between GDP and GR for China. Thus, we found causal relationship between taxes

Table 2

Stationarity Test

Country	Series	T-Stat at level	T-Stat at 1 st Diff	T-Stat at 2 nd Diff
China	GDP	5.248168	0.658842	-7.343104***
	TR	-2.964392	-1.903234	-2.53046
	TE	5.081935	0.286645	-7.219617***
Japan	GDP	-1.948312	-20.0339***	-
	TR	-3.111972	-19.32771***	-
	TE	-2.950205	-20.4438***	-
DPR_Korea	GDP	-1.244868	-11.53631***	-
	TR	-1.150713	-11.19009***	-
	TE	-1.251863	-10.98609***	-
REP_Korea	GDP	-2.933823	-12.02503***	-
	TR	-2.55044	-11.40125***	-
	TE	-8.039899	-	-
Mongolia	GDP	5.163363	0.401205	-7.653374***
	TR	2.393275	-9.560818***	-
	TE	-0.749078	-13.12827***	-
Pakistan	GDP	4.273836	-13.52696***	-
	TR	4.135193	-13.74115***	-
	TE	3.880672	-13.41739***	-
India	GDP	4.126754	-3.802499***	-
	TR	3.546969	-3.625077***	-
	TE	3.462001	-3.386252**	-
Bangladesh	GDP	4.600870	0.626614	-5.13124***
	TR	4.774890	0.687782	-5.225345***
	TE	4.441068	0.513419	-4.446576***
Sri Lanka	GDP	3.775781	-9.344954***	-
	TR	3.572680	-9.537214***	-
	TE	4.330833	-9.117332***	-
Nepal	GDP	1.272942	-13.58352***	-
	TR	2.525390	-12.84435***	-
	TE	1.220347	-13.67587***	-

Source: Author Calculations

Note: (***), (**), and (*) implies statistical significance at 1%, 5%, and 10% respectively.

and expenditures in China, Pakistan, and Nepal.

The results are align with the findings of Chang et al. [24] and Yashobanta & Behera [18]. Increase in country expenditures are contributed to increase in revenues. The same results were reported by Nyamongo et al [36], who found a bidirectional causality between GR and GE. Expenditures are mainly focused on household well-being oriented as given in

Tables 1, final consumption expenditures, household consumption expenditures, education, and health. Likewise, revenues are increased in response to increase in expenditures, the feedback causal effect were found in Nepal. Our findings detect one way causality running from taxes to expenditures for China, Pakistan, and Nepal. The feedback casualty for Nepal are matching the results of Narayan & Narayan [32].

Table 3

Co-integration test results

Country	Hypothesis	Trace Test	Prob	Eigen Max	Prob
East Asia					
China	H0 : r = 0	43.03438	0.0009	34.19810	0.0004
	H0 : r <= 1	8.836279	0.3807	6.584025	0.5395
	H0 : r <= 2	2.252254	0.1334	2.252254	0.1334
Japan	H0 : r = 0	33.40575	0.0184	18.94856	0.0984
	H0 : r <= 1	14.45719	0.0712	9.246658	0.2662
	H0 : r <= 2	5.210535	0.0224	5.210535	0.0224
North Korea	H0 : r = 0	37.67749	0.0050	31.38260	0.0013
	H0 : r <= 1	6.294889	0.6607	3.762730	0.8835
	H0 : r <= 2	2.532159	0.1115	2.532159	0.1115
South Korea	H0 : r = 0	29.91265	0.0485	21.67621	0.0419
	H0 : r <= 1	8.236440	0.4405	6.495703	0.5504
	H0 : r <= 2	1.740738	0.1870	1.740738	0.1870
Mongolia	H0 : r = 0	32.93761	0.0210	17.45260	0.1517
	H0 : r <= 1	15.48500	0.0502	10.53983	0.1788
	H0 : r <= 2	4.945171	0.0262	4.945171	0.0262
South Asia					
Pakistan	H0 : r = 0	22.70850	0.2607	13.31448	0.4237
	H0 : r <= 1	9.394027	0.3302	9.334001	0.2594
	H0 : r <= 2	0.060025	0.8064	0.060025	0.8064
India	H0 : r = 0	51.47725	0.0000	36.75872	0.0002
	H0 : r <= 1	14.71853	0.0652	13.05722	0.0769
	H0 : r <= 2	1.661316	0.1974	1.661316	0.1974
Bangladesh	H0 : r = 0	84.54188	0.0000	52.33004	0.0000
	H0 : r <= 1	32.21183	0.0001	29.47225	0.0001
	H0 : r <= 2	2.739583	0.0979	2.739583	0.0979
Sri Lanka	H0 : r = 0	56.52883	0.0000	43.34315	0.0000
	H0 : r <= 1	13.18568	0.1082	12.85967	0.0824
	H0 : r <= 2	0.326015	0.5680	0.326015	0.5680
Nepal	H0 : r = 0	52.50069	0.0000	45.28498	0.0000
	H0 : r <= 1	7.215707	0.5527	6.416472	0.5604
	H0 : r <= 2	0.799235	0.3713	0.799235	0.3713

Source: Author Calculations

Table 4

Granger Causality Test

Country	Null Hypothesis	F-Stat	Prob	Country	Null Hypothesis	F-Stat	Prob
China	TR > GDP	0.93999	0.4265	Pakistan	TR > GDP	12.9401	1.00E-06
	GDP > TR	6.65589	0.0005		GDP > TR	11.7365	3.00E-06
	TE > GDP	4.22208	0.0086		TE > GDP	1.03559	0.3827
	GDP > TE	4.73453	0.0047		GDP > TE	0.91769	0.4373
	TE > TR	9.27083	3.00E-05		TE > TR	2.06086	0.1139
	TR > TE	2.94800	0.0391		TR > TE	2.36858	0.0786
Japan	TR > GDP	1.10195	0.3547	India	TR > GDP	2.79447	0.04712
	GDP > TR	1.36753	0.2604		GDP > TR	3.02862	0.03555
	TE > GDP	0.60086	0.6167		TE > GDP	11.2403	5.00E-06
	GDP > TE	0.66593	0.576		GDP > TE	16.6461	4.00E-08
	TE > TR	0.97143	0.4116		TE > TR	12.5928	1.00E-06
	TR > TE	0.87413	0.4591		TR > TE	14.8867	2.00E-07
North Korea	TR > GDP	0.42678	0.7345	Bangladesh	TR > GDP	17.2035	2.00E-08
	GDP > TR	0.55673	0.6455		GDP > TR	16.9850	3.00E-08
	TE > GDP	2.24106	0.0916		TE > GDP	8.43648	8.00E-05
	GDP > TE	2.25623	0.0925		GDP > TE	9.85678	2.00E-05
	TE > TR	0.86664	0.4629		TE > TR	18.5737	8.00E-09
	TR > TE	0.50991	0.6768		TR > TE	22.0665	5.00E-10
South Korea	TR > GDP	1.83848	0.1487	Sri Lanka	TR > GDP	1.42754	0.2426
	GDP > TR	1.69610	0.1764		GDP > TR	1.19103	0.32
	TE > GDP	1.45231	0.2356		TE > GDP	10.0039	2.00E-05
	GDP > TE	2.06622	0.1131		GDP > TE	7.98022	0.0001
	TE > TR	1.43872	0.2394		TE > TR	11.5998	3.00E-06
	TR > TE	2.05864	0.1142		TR > TE	9.01739	4.00E-05
Mongolia	TR > GDP	1.26079	0.2952	Nepal	TR > GDP	0.11441	0.9514
	GDP > TR	1.12161	0.3469		GDP > TR	0.10221	0.9585
	TE > GDP	0.43573	0.7282		TE > GDP	2.40069	0.0756
	GDP > TE	1.25623	0.2968		GDP > TE	3.15595	0.0305
	TE > TR	0.24860	0.862		TE > TR	2.75623	0.0525
	TR > TE	1.20255	0.3159		TR > TE	2.79803	0.0468

Source: Author Calculations

Yet no consistent and firm conclusion can be drawn from the causal relationship between GR and GE for most of the countries. Differences in results are the outcome of differences in political system, budget process, and model specifications.

6. Conclusion

The relationship between GR and GE is shaping the economic health and fiscal stability of a country. Government

often involves in borrowing to cover budget deficits, and an imbalance in this relationship can results in unsustainable accumulation of debt. Understanding of GR and GE is important for policy makers to avoid budgets deficits.

We examined the GDP, GR and GE for ten countries. Nine out of ten countries have co-integration among GDP, GR and GE. For China, Pakistan, Nepal, GR causes GE and are consistent with tax-and-spend hypothesis.

The tax-and-spend hypothesis for China, Pakistan, and Nepal indicates the demand for goods and services is grown larger from 1980 to 2017, and hence widened government spending base.

However, this does not mean that lower taxes will cause lower expenditures, the government in situations of lower tax returns opts for debt financing rather than tax financing. For Nepal GE Granger causes GR and are consistent with spend-and-tax hypothesis. For Japan, South Korea, North Korea, Mongolia, India, Bangladesh, and Sri Lanka we found neutrality among GR and GE and are inconsistent with fiscal synchronization hypothesis.

The findings confirm that tax strategies in south and eastern Asian nations have little effect on reducing budget deficits and do not provide long-term solutions to fiscal issues. The bottom line of deficit issue is to reduce spending. In contrast, our findings support increase in taxes may be a good solution to budget deficit problem in China, Pakistan, and Nepal.

On the other hand, in Japan, South Korea, North Korea, Mongolia, India, Bangladesh, and Sri Lanka budget deficits can be reduced if revenues and expenditures are controlled simultaneously. It is important for the policymakers to take into account the elusive strategies needed to solve the fiscal difficulties in these countries. To deal with the budget deficits the study conclusion has the number of policy implications for the south and east Asian nations.

The study major implications are, *first*, according to the study, raising tax rates in countries like, Pakistan, China, and Nepal could be a good way to cut budget deficits. To enhance revenues and ensure financial sustainability, policymakers in these countries should think about enacting tax polities adjustments.

Second, the findings highlight the importance of government spending reduction as a key strategy to manage budget imbalances. To attain sustainable fiscal results, policymakers in south and East Asian countries should place high priority to public spending and fiscal restraint.

Third, the study emphasizes the balance of both revenue generation and expenditure control for countries including Japan, South Korea, North Korea, Mongolia, India, Bangladesh, and Sri Lanka. A complete fiscal management approach for policymakers should be used by increasing income collection and reining in spending.

Fourth, the continual monitoring of fiscal indicators is important for policymakers to employ given the variety of fiscal difficulties in the region. They should modify and adopt their programs in response to shifting financial needs and shifting economic situations.

Fifth, countries of South and East Asia could gain for cooperation and sharing expertise. Engaging in knowledge and technology exchange with nations that have dealt with budget deficits.

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