Fiscal policy and her roles in stimulating output growth in Cambodia: Bayesian inference based on BMA and MCMC simulation

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JOMEINO
ISSN:
2522-381X (Print)
2521-7054 (Online)
DOI: 10.31039/jomeino

Received 18 March 2019

Revised 22 April 2020

Accepted 04 May 2020

Citation: Monorith Sean, M., & Yim C. (2020). Fiscal policy and her roles in stimulating output growth in Cambodia: Bayesian inference based on BMA and MCMC simulation. *Journal of Management, Economics, and Industrial Organization, 4*(2), 109-129. http://doi.org/10.31039/jomeino.2020.4.2.7

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Abstract

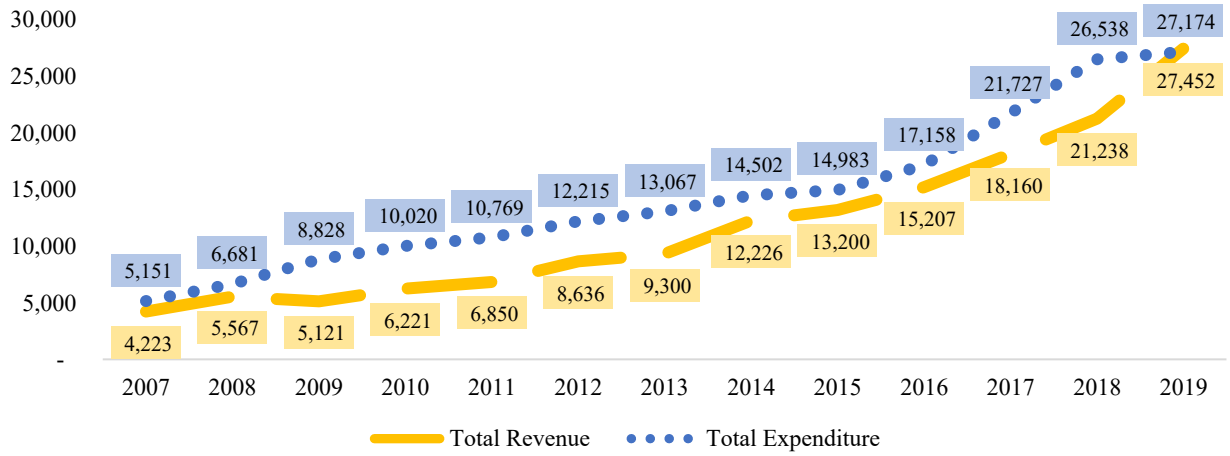
This research paper aims to examine the impact of fiscal policy on Cambodia's economic growth. More than that, this research also figures out fiscal stance on whether fiscal policy in Cambodia is contractionary or expansionary to stimulate the economy over the past two decades. Due to the limited observation, from 1994 through 2019, a totally of 26 years, this study employs Bayesian inference based on Bayesian Model Averaging (BMA) and Markov Chain Monte Carlo (MCMC) which uses Gibb Sampling to approximate posterior mean. By comparing these two approaches, the empirical results are identical. The empirical result revealed that *Def, Debt, Faids, Er and Ex* which represent government deficit, public debt, foreign aid, nominal exchange rate (KHR/USD) and export, respectively, are positive correlation with output growth in Cambodia. The increase in the deficit, public debt and foreign aid, means the government utilizes the fiscal policy to fine-tune the economy. Furthermore, this study also confirms that fiscal policy in Cambodia is conducted as a consolidated and stabilized policy. It can be concluded that the increase in the deficit, public debt, and foreign debt could stimulate the economy during the recession period where fiscal policy is acted as expansionary policy. During a post-recession, on the other hand, Royal Government of Cambodia (RGC) will conduct a contractionary fiscal policy to cool down the economy especially when the economy is overheating.

Keywords: Markov Chain Monte Carlo, Bayesian Model Averaging, fiscal policy, contractionary, expansionary

1. Introduction

For the past two decades, Cambodia has made remarkable progress by maintaining economic growth at a rate of 7%. Precisely, in 2019, growth has achieved at a rate of 7.1% (Ministry of Economy and Finance, 2019). Fiscal policy plays an essential role in speeding up growth for the past two decades. Fiscal policy, theoretically, refers to government spending and tax. The government takes a significant role as expressed in Keynesian points of view to boost the aggregate demand (CFI, 2020). In Cambodia, Government spending is taken by two channels, namely current expenditure, and capital expenditure. Furthermore, revenues are also extracted from two sources which include current revenues and capital revenues (MEF, 2019). Figure 1 illustrates expenditures and revenues which includes those two channels.

Figure 1: Government Expenditures and Revenues (In Billion Riel)

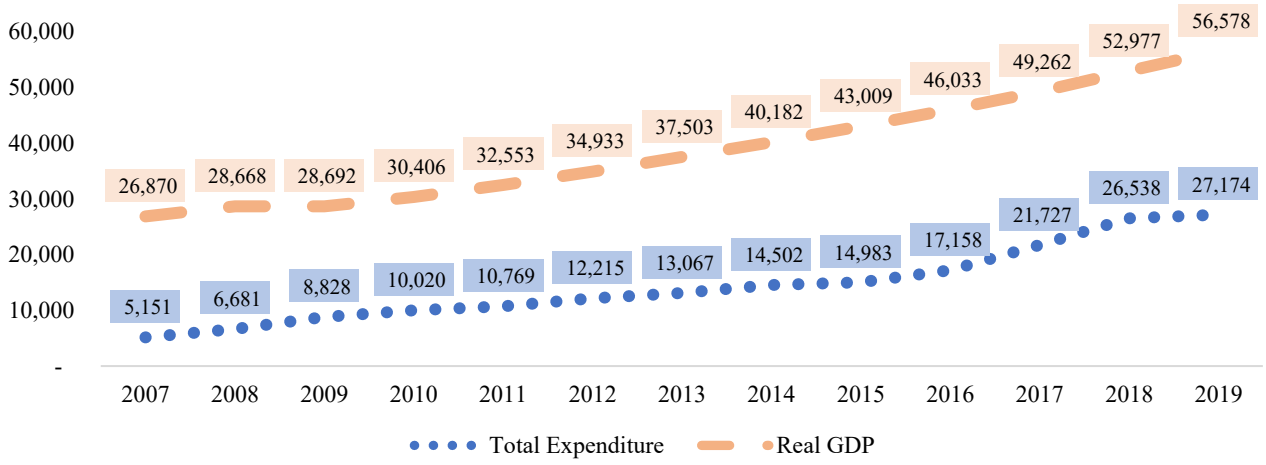


Source: MEF, 2020

Based on Figure 1, it can be seen that fiscal balance currently has been running a deficit. Precisely, in 2018, total expenditures and total revenues are 26,538 and 21, 238 billion Riel, respectively, which indicates a budget deficit of approximately 5.8% of GDP. However, in 2019, the overall fiscal balance exhibited a surplus, 0.3% of GDP due to the impressive performance of revenue collection during the year and good fiscal and financial discipline.

The Royal Government of Cambodia (RGC) has been prioritizing the spending on significant sectors which is called "Budget-Policy Linkage" (PFM, 2016). Generally, in current expenditure, RGC has been classifying 4 sectors which comprise of general administration, national defense, public order, social and economic sector. Government expenditure has been playing a critical role in promoting economic growth and also a key for RGC to achieve the targeted goal to transform Cambodia to be a middle-upper income in 2030 and a higher income country in 2050 (WB, 2018). Figure 2 displays a movement between government expenditure and real GDP in Cambodia.

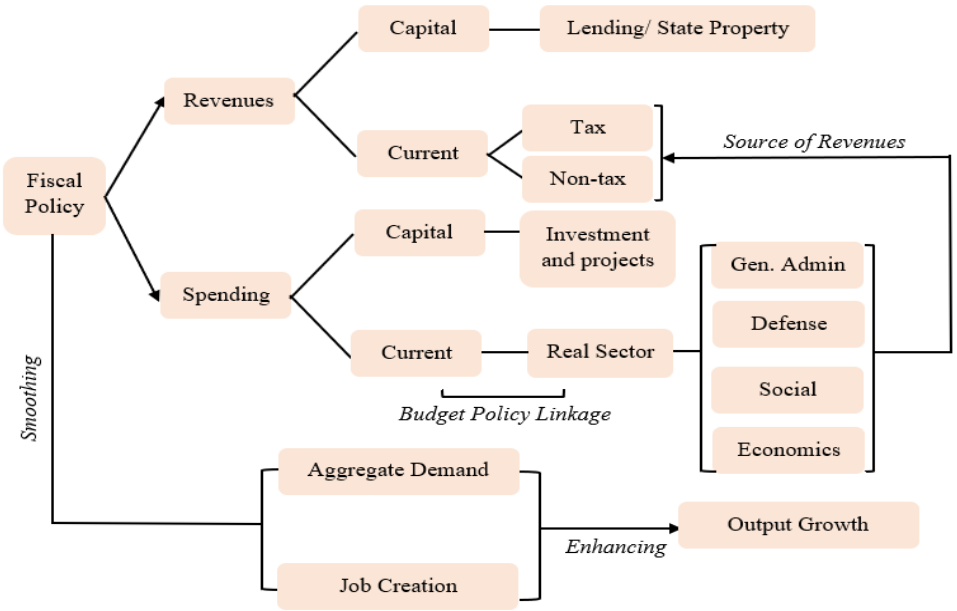
Figure 2: Government Expenditure and real GDP (In Billion Riel)



Source: MEF and NIS, 2019

Based on Figure 2, there is a movement between government expenditure and real GDP. It can be seen a positive trend between these two variables. From these points of view, Government expenditure has been playing a powerful tool for fiscal policy in Cambodia which helps smooth growth by pushing the aggregate demand and smoothing job creation (Figure 3).

Figure 3: Fiscal and Output Diagram



Source: Author

2. Literature review

Fiscal policy and related topics have been widely studied based on different and specific key objectives. (Gerson, 1998) studied the impact of fiscal variables on output growth. This paper surveyed both theoretical and empirical literature on the relationship between taxation and expenditure on economic growth. This study suggested that well-targeted current expenditure especially on health, education and capital investment should have a positive impact on growth. (Ndari Surjaningsih, 2012) examines the relationship between fiscal policy and output in Indonesia. By using Model Vector Error Correction (VECM) over quarterly data spanning the period 1992 to 2009, the empirical revealed that government spending and taxation, in the long run, have a positive impact on economic growth. Short term adjustment suggested that an increase in government deficit is more effective to stimulate economic growth during the recession period. (Arnelyn Abdon, et at. 2014) has observed fiscal policy and growth in developing Asia. Employing panel data, the empirical results suggested that fiscal policy can help developing Asia to stimulate the economy through government spending. The composition of taxes and spending matter the economic growth in developing Asia. (Haque, 2017) investigate the impact of fiscal deficit on economic growth in Bangladesh. By using the VECM model during the period 1993 to 2016 from two sources of the dataset, namely, Bangladesh Bureau of Statistics (BBS) and the World Bank. The empirical result found that there is a positive relationship of fiscal deficit and economic growth in Bangladesh based on the BBS dataset. According to the World Bank data, on the other hand, there is a negative correlation between these two variables. Given the finding from this study, on the relationship between fiscal deficit and economic growth in Bangladesh, policymakers have to ensure that most of the expenditure outlay is fully, timely and effectively utilized. (Matalah, 2017) has written his paper to answer the question "Does fiscal policy spur economic growth? empirical evidence from Algeria". By using Johansen's cointegration to access the long-run correlation from 1975 to 2015, the empirical result has suggested that productive current expenditure spur the economic growth in Algeria. It could be concluded that to achieve sustainable economic growth, it requires serious policy measures aimed at diversifying the Algerian economy. (Bhattarai, 2009) has specifically observed the impact of foreign aid on growth in Nepal. Using cointegration and error correction mechanisms, the result revealed that there is a positive significant correlation between foreign aids and GDP per capita in Nepal in the long run. More importantly, aid effectiveness improves in the presence of a good policy environment. Moreover, (Moolio, 2015) also confirms the positive correlation between foreign aids and economic growth in Cambodia by employing a co-integration approach during the period 1991-2012. However, there are many research papers that also confirm the negative correlation between foreign aids and growth, namely, (Quy, 2016) and (Lau, 2018).

3. Research methodology and data collection

This research paper aims to observe the impact of fiscal policy on economic growth in Cambodia. Besides that, this research also looking at the behavior of fiscal policy which has been implemented by RGC. This study uses the data spanning the period of 1994 to 2019 which is 26 observations. Since there is limited data, this study uses Bayesian inference. This study employs Bayesian Model Averaging based on (Zeugner, 2011) which select the top best model to provide the effects of explanatory variables on dependent variable. Another alternative, this study also employs the Bayesian approach based on the Markov chain Monte Carlo (MCMC) simulation which introduced by (Bradley P. Carlin and Chib, 1995) depends on Gibb sampling to approximate the posterior distribution. In theory, MCMC performs better than a simple Bayesian approach especially in a high dimension of explanatory variables (Rocca, 2019).

In this study, Real GDP is set as dependent variables while primary deficit, public debt and foreign aids are treated as an explanatory variable. Furthermore, the exchange rate and export which represent the monetary condition and external sector is included in an independent variable to be a proxy variable. Hence, the model could be written as:

$$Y_t = \beta_0 + \beta_1 DEF_t + \beta_2 DEBT_t + \beta_3 FAIDS_t + \beta_4 ER_t + \beta_5 EX_t + \varepsilon_t \quad (1)$$

Where

- Y_t is real GDP (Billion Riel)
- DEF_t is primary deficit (Billion Riel)
- $DEBT_t$ is public debt (Billion Riel)
- $FAIDS_t$ is foreign aid (Billion Riel)
- ER_t is the nominal exchange rate (Riel/USD)
- EX_t is total export (Billion Riel)

The data has been extracts from many useful sources such as Table of Finance and Economy (TOFE) of Ministry of Economy and Finance (MEF), National Bank of Cambodia (NBC) and the World Bank.

Since this study uses logarithm for equation expression, (1) could be written as below:

$$y_t = \beta_0 + \beta_1 Def_t + \beta_2 Debt_t + \beta_3 Faids_t + \beta_4 Er_t + \beta_5 Ex_t + \varepsilon_t \quad (2)$$

Where

- $\mathrm{y} = lnY$
- $\mathrm{Def} = lnDEF$
- $\mathrm{Debt} = lnDEBT$
- $\mathrm{Faids} = lnFAIDS$
- $\mathrm{Er} = lnER$
- $\mathrm{Ex} = lnEX$

Equation (2) Could be transformed into basic linear regression, it could be written as:

$$y_t = \beta_0 + X_{\mathrm{i}}\beta_{\mathrm{i}} + \varepsilon_t \tag{3}$$

Where

- X_{i} is a vector of explanatory variables
- $\varepsilon_t \sim N(0, \sigma^2 I)$ is disturbance

To fit into our (1), (2) could be written as:

$$y_t = \beta_0 + \beta_{\mathrm{i}} \sum_{\mathrm{i}=1}^{5} X_{\mathrm{i}} + \varepsilon_t \tag{4}$$

3.1 Bayesian Model Averaging (BMA)

Bayesian Model Averaging (BMA) tackles the problems with many potential explanatory variables by estimating models for all possible combinations of *{X}* and constructing a weighted average over all of them. If *X* contains *J* potential variables, this means estimating 2^J variable combinations and thus 2^J models. The model weights for this averaging stem from posterior model probabilities that arise from Bayes' theorem:

$$P(M_{\mathrm{i}}|y, X) = \frac{P(y|M_{\mathrm{i}}, X)P(M_{\mathrm{i}})}{P(y|X)} = \frac{P(y|M_{\mathrm{i}}, X)P(M_{\mathrm{i}})}{\sum_{i=1}^{2^J} P(y|M_{\mathrm{i}}, X)P(M_i)} \tag{5}$$

Where

- *P(y|X)* indicates an integrated likelihood function which contains overall models and is a multiplicative term.
- $P(M_{\mathrm{i}}|y,X)$ is the posterior model probability (PMP) is proportional to the marginal likelihood of the model $P(y|M_{\mathrm{i}},X)$ which is the probability of the data given model M_{i} times a prior model probability $P(M_{\mathrm{i}})$.

If the model weighted posterior distribution for any statistic θ is the coefficient of β then:

$$P(\theta|y,X) = \sum_{i=1}^{2^J} P(\theta|M_{\mathrm{i}},y,X)\,P(M_{\mathrm{i}}|X,y) \tag{6}$$

Since this study introduces Zellner's g prior, their variance structure is defined according to Zellner's g:

$$\sigma^2\left(\frac{1}{g}X_i'X_i\right)^{-1}$$

$$\beta_i|g \sim N\left(0,\sigma^2\left(\frac{1}{g}X_i'X_i\right)^{-1}\right)$$

The posterior distribution of coefficients reflects prior uncertainty. Given g, it follows a t-distribution with expected value $E(\beta_i|y,X,g,M_{\mathrm{i}}) = \frac{1}{(1+g)}\hat{\beta}_i$, where $\hat{\beta}_i$ is the standard OLS estimator of model *i*. The posterior variance of g:

$$Cov(\beta_i|y,X,g,M_{\mathrm{i}}) = \frac{(y-\bar{y})'(y-\bar{y})}{N-3}\frac{g}{1+g}\left(1-\frac{g}{1+g}R_i^2\right)(X_i'X_i)^{-1} \tag{7}$$

The posterior covariance in (6) is similar to that of the OLS estimator, times a factor that includes g and R_i^2, the OLS R-squared for model *i*.

For BMA framework results into a simple marginal likelihood $P(y|M_{\mathrm{i}},X,g)$ that is relevant with the R-squared and includes a size penalty factor adjusting for model size k_{i}:

$$P(y|M_{\mathrm{i}},X,g) \propto (y-\bar{y})'(y-\bar{y})^{-\frac{N-1}{2}}(1+g)^{-\frac{k_i}{2}}\left(1-\frac{g}{1+g}\right)^{-\frac{N-1}{2}} \tag{8}$$

3.2 Bayesian with MCMC Simulation

The Bayesian model uses the MCMC method based on the Gibbs Sampling procedure. Gibbs sampling is computed by sampling all conditional posterior distributions from (3). The prior distribution of (β, σ^2) are assumed to be conditionally multivariate normal distribution and inverse gamma distribution, respectively.

$$\beta|\sigma^2 \sim N(\beta_0, \sigma^2 B_0)\ ,\ \sigma^2 \sim IG(\tfrac{n_0}{2}, \tfrac{S_0}{2}) \tag{9}$$

where β_0 is $K \times 1$ known constant vector, B_0 is a $K \times K$ known constant matrix, and n_0 and S_0 are shape and scale of parameters respectively. If $x_i' = (x_1, x_2, \ldots\ldots x_n)$ and $\varepsilon_i = (\varepsilon_1, \varepsilon_2, \ldots\ldots \varepsilon_n)' \sim N(0, \sigma^2)$, $n_1 = n_0 + n$. Given y, we obtain the joint posterior distribution:

$$\pi(\beta, \sigma^2|y) \propto\ \pi(y|\ \beta, \sigma^2)\pi(\sigma^2)\pi(\beta) \tag{10}$$

Then we obtain the joint posterior distribution of $\pi(\beta, \sigma^2|y)$ given by:

$$\pi(\ \beta, \sigma^2|y) \propto (\sigma^2)^{-\left(\frac{n_1}{2}+1\right)} \times exp\left\{-\tfrac{1}{2}\textstyle\sum_{i=1}^{n} \frac{1}{\sigma^2}(y_i - x_i'\beta)^2\right\}$$

$$\times exp\left\{-\tfrac{1}{2}(\beta - \beta_0)' \tfrac{1}{\sigma^2 B_0}(\beta - \beta_0) - \tfrac{S_0}{2\sigma^2}\right\} \tag{11}$$

The conditional posterior distribution of β is:

$$\pi(\beta|\ \sigma^2, y)\ \propto exp\left\{-\frac{1}{2}\sum_{i=1}^{n} \frac{1}{\sigma^2}(y_i - x_i'\beta)^2 - \frac{1}{2}(\beta - \beta_0)' \frac{1}{\sigma^2 B_0}(\beta - \beta_0)\right\}$$

$$\times exp\ \{-\tfrac{1}{2}(\beta - \beta_1)' \tfrac{1}{\sigma^2 B_1}(\beta - \beta_1)\} \tag{12}$$

where $B_1^{-1} = B_0^{-1} + \sum_{i=1}^{n} \tilde{x}_i'\, \tilde{x}_i$, $\beta_1 = B_1(B_0^{-1}\beta_0, + \sum_{i=1}^{n} \tilde{x}_i'\, \tilde{y}_i)$

The conditional posterior distribution of σ^2 is:

$$\pi(\sigma^2|,\beta,y) \propto (\sigma^2)^{-\left(\frac{n_1}{2}+1\right)} exp\left\{-\frac{1}{2\sigma^2}[\sum_{i=1}^{n}(y_i - x_i'\beta)^2 + S_0]\right\}$$

$$\times exp\left\{-\frac{S_1}{2\sigma^2}\right\} \quad (13)$$

where $S_1 = y'y + \beta_0' B_0^{-1}\beta_0 + S_0 - \beta_1' B_1^{-1}\beta_1$.

The conditional posterior distributions (12) and (13) could be written as:

$$\beta|\sigma^2, y \sim N(\beta_1, \sigma^2 B_1) \quad (14)$$

$$\sigma^2|y \sim IG(\frac{n_1}{2}, \frac{S_1}{2}) \quad (15)$$

Then, we sample from the conditional posterior distributions using Gibbs Sampling:

Algorithm Gibbs Sampling

1) Initialize $\beta \; and \; \sigma^2$.
2) Sample $y|\beta, \sigma^2$

   Generate $y_i|| \; \beta, \sigma^2 \sim N_{(-\infty,+\infty)}(x_i'\beta, \sigma^2)$, $i = 1,2 , \ldots . , n-k,$
3) Sample $(\beta, \sigma^2)| \; y$

   3.1) Sample $\sigma^2| \; y \sim IG(\frac{n_1}{2}, \frac{S_1}{2})$

   3.2) Sample $\beta|\sigma^2, y \sim N(\beta_1, \sigma^2 B_1)$
4) Go to 2 and Repeat.

4. Empirical results

4.1 Empirical finding

The empirical findings are divided into two different models namely BMA and MCMC. Table 1, displays the output of BMA methodology which provides "p! =0" that indicates the probability of coefficient is given is not zero, while "EV" displays the BMA posterior distributions mean of each coefficient and "SD" implies BMA posterior distribution standard deviation for each coefficient. Model 1 until model 3 reports the top best 3 model that statistically chosen based on BIC.

Table 1: BMA Output

Description	p! = 0	EV	SD	Model 1	Model 2	Model 3
Intercept	100.0	-2.27	2.06	***-2.17***	-4.67	0.99
def	100.0	0.51	0.12	***0.50***	0.50	0.57
debt	100.0	0.23	0.07	***0.23***	0.27	0.20
faids	100.0	0.50	0.07	***0.50***	0.53	0.49
er	85.6	0.40	0.24	***0.40***	0.67	-
ex	77.7	0.02	0.02	***0.03***	-	0.05
nVar	-	-	-	***5***	4	4
BIC	-	-	-	***-42.15***	-40.07	-39.20
post.prob	-	-	-	***0.63***	0.23	0.14

Source: Author's calculation

Based on BMA output*, def, debt and faids* which represent primary deficit, public debt, and foreign aids, respectively, obtain high posterior probability, which implies a significant impact on economic growth in Cambodia. *er and ex* which represent exchange rate and export also illustrate high probability 85 and 77, consecutively. Since all variables are applied logarithm the coefficient is interpreted as elasticity. Based on Table 1, primary deficit and foreign aids display a large coefficient compares to the rest of other variables with mean 0.51 and 0.50, respectively. Model 1 is chosen to be the top best model since it reports a lower value of BIC, -41.15 compares to the other two models.

Table 2a demonstrates MCMC output. "Mean" is the posterior mean which has been simulated and approximated by MCMC simulation with the number of iterations is 500,000 and 5,000 as a burn-in period. "SD" stands for the standard deviation of the posterior mean of each variable. "Naïve-SE" represents the standard error which the ratio of the standard deviation to a number of observations. Table 2b points out the quantile of interest of each variable within a 5-specific quantile, 2.5%, 25%, 50%, 75% and 97.5% in a 95% as confidence interval.

Table 2a: MCMC Output

Description	Mean	SD	Naïve SE	Time-series SE
Intercept	-2.17	1.50	0.00	0.00
def	0.50	0.12	0.00	0.00
debt	0.23	0.07	0.00	0.00
faids	0.50	0.07	0.00	0.00
er	0.40	0.17	0.00	0.00
ex	0.03	0.01	0.00	0.00
Sigma2	0.00	0.00	0.00	0.00

Source: Author's calculation

Table 2b: Quantile of Interest

Description	2.5%	25%	50%	75%	97.5%
Intercept	-5.01	-3.13	-2.17	-1.21	0.74
def	0.26	0.42	0.50	0.60	0.75
debt	0.10	0.18	0.23	0.27	0.36
faids	0.35	0.45	0.50	0.54	0.64
er	0.06	0.28	0.40	0.50	0.73
ex	0.00	0.02	0.03	0.03	0.05
Sigma2	0.00	0.00	0.00	0.00	0.00

Source: Author's calculation

Based on MCMC output, Table 2a, it can be seen that *Def, Debt, Faids, Er and Ex* display positive on economic growth in Cambodia. All coefficients generated by MCMC are identical to those in model 1 which is chosen by BMA based on Table 1. Moreover, based on Table 2a the coefficient of all explanatory variables exhibits the same value as in 50% quantile which is given by Table 2b which means that all independent variables are normal distribution. However, by using MCMC simulation, it is essential to access the convergent tests to ensure the convergence of each chain.

Table 3 displays a Raftery Test which one of many important tests to examine whether the chain converges its posterior distributions. According to Table 3, there is no evidence to confirm the non-convergence in

the chain which could be seen through the independence factor in which all values are felt below 5.0. Hence, all explanatory variables display positive significance on economic growth in Cambodia.

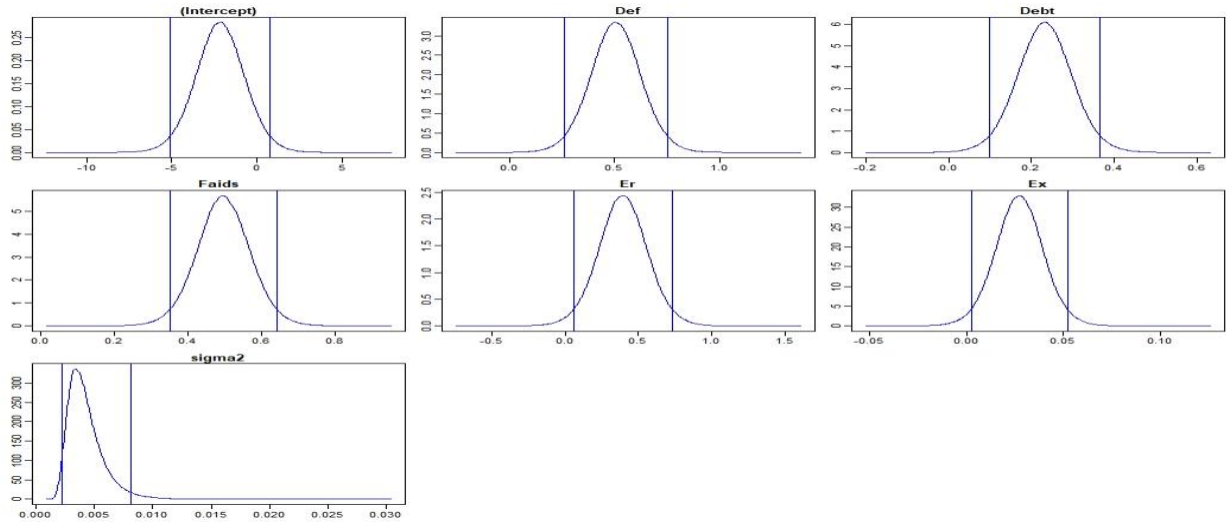
Table 3: Raftery Test

Description	Burn-in (M)	Total (N)	Lower bond (Nmin)	Dependence factor (I)
Intercept	2	3866	3746	1.03
def	2	3846	3746	1.03
debt	2	3856	3746	1.03
faids	2	3863	3746	1.03
er	2	3864	3746	1.03
ex	2	3874	3746	1.03
Sigma2	2	3975	3746	1.06

Source: Author's calculation

There are three necessary plots to visualize the convergence of each explanatory variable. The first plot to be shown is the kernel density plot. The kernel density plot displays the distribution of each variable while the second plot is a trace plot which illustrates the mixing and convergence of each variable. Last but not least, is the running plot. The running plot shows the stability or stationary of each variable for the post-burn-in period.

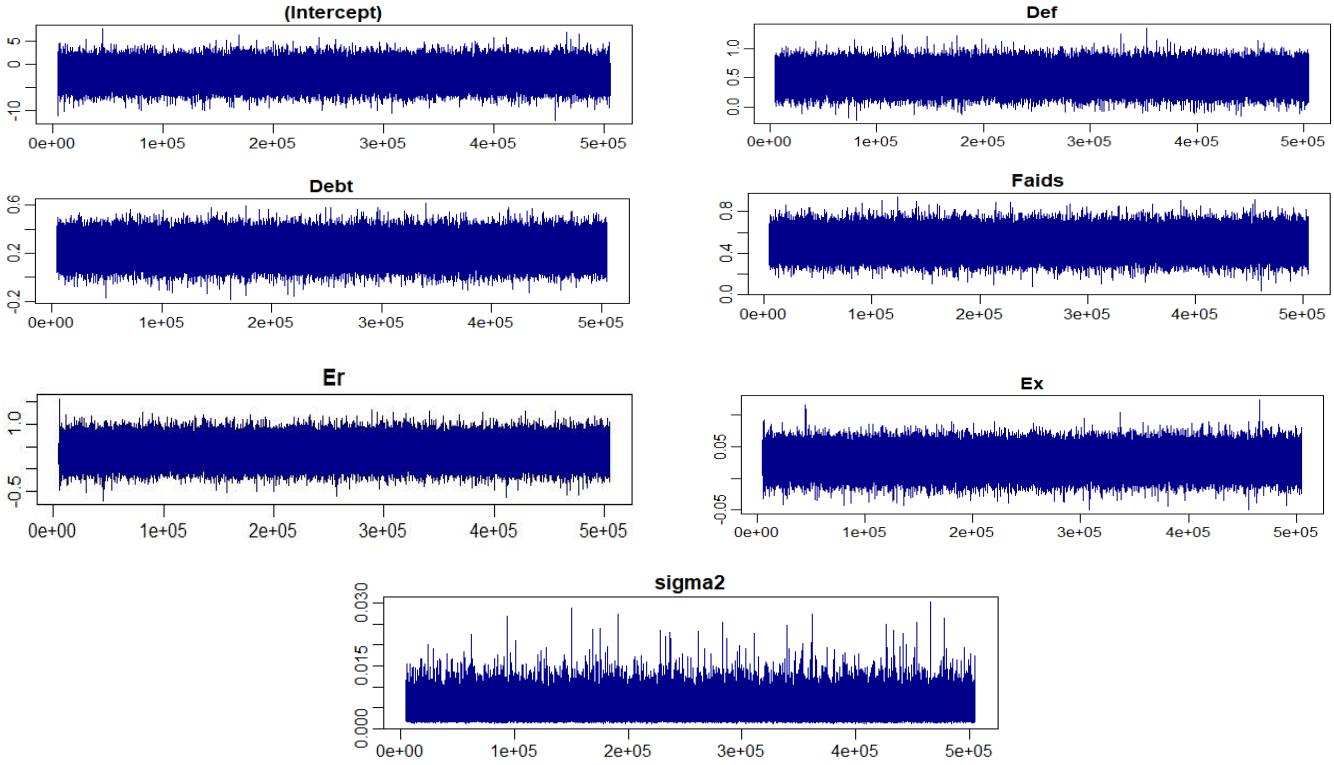
Figure 4: Kernel Density Plot



Source: Author's calculation

Figure 6 displays kernel density plots. Based on Figure 6, it can be seen that each explanatory variable is identical normal distribution while variance displays inverse gamma distribution. It could be concluded that all variables are significant and convergence. Figure 7, moreover, exhibits trace plots. According to Figure 7, all chains are converged and well-mixed. Hence, there is no evidence in non-convergence basically for the post-burn-in period.

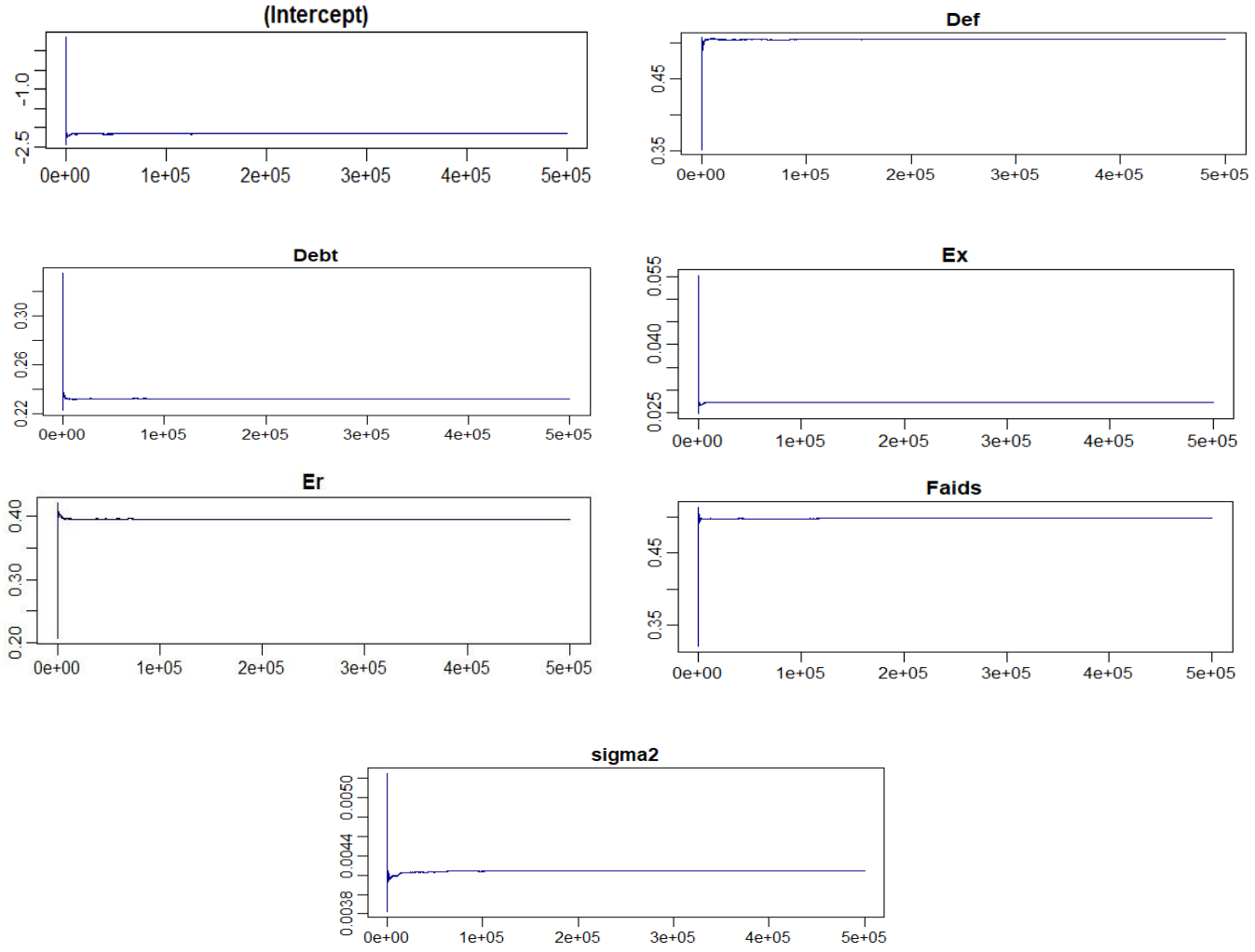
Figure 5: Trace Plot



Source: Author's calculation

Last but not least, Figure 8 displays the running mean plot. Based on Figure 8, all variables including variance are stable after the burn-in period which indicates no evidence of non-convergence.

Figure 6: Running Mean Plot



Source: Author' calculation

Based on BMA model 1's output and MCMC output, all coefficients report the same value. Hence, it can be concluded that all explanatory variables, namely, *def, debt, faids, er and ex* which represent government deficit, public debt, foreign aids, exchange rate and export which represent the trade are positive significance on output growth in Cambodia.

The government deficit in this study implies the deviation between revenue and expenditure (capital & current expenditure). Based on these two outputs, deficit displays positive correlation with output growth with the mean (0.50) and standard error (0.00) which implies that a 1 percentage change in government deficit could stimulate the growth of approximately 0.50 percentage points. This empirical finding is slightly different from other research papers. However, this empirical result is in line with (Ahmad, 2010)

and (Haque, 2017) which confirmed that fiscal deficit positively influences output growth in the short run. In Cambodia, Fiscal policy plays an essential role to stimulate the economy through keeping business floating, ensuring job creation, and promoting consumption. Fiscal policy is extremely more effective than monetary policy since Cambodia is still characterized as a dollarized economy.

Public debt, moreover, also has a positive impact on output growth in Cambodia with the mean (0.23) with standard error (0.00). This implies that a 1 percentage change in public debt causes output to grow by 0.23 percentage point. This finding is different from even the theory and some empirical studies where there is no consensus regarding of the sign of the impact of public debt on output in either short run and long run (Sosvilla-Rivero, 2017). Some empirical studies such as (Koffi, 2019) and (Sanusi, K.A., et at. 2019) have found a non-linear relationship between these two variables. However, (Elmendorf, 1999) states that in the short run, since the output is determined by the demand, government debt can have a positive impact on disable income, aggregate demand, and overall output. Moderate levels of debt are confirmed to have a positive short-run impact on economic growth. In Cambodia, debt-to-GDP was about 28% in 2018 which is in a manageable range. Furthermore, this positive significance is associated with the deficit; once the deficit increase causes public debt to surge.

Foreign aid, furthermore, also has a positive impact on output growth in Cambodia with the mean (0.50) and standard error (0.00) which implies that a 1 percentage change in foreign aids leads to increase output with 0.50 percentage point. This empirical result is associated with many empirical studies. (Charles, 2017) found that subsequent aid is geared towards promoting the country's domestic investment given its positive effect and higher potential to boost its economic growth. In Cambodia, most of ODA basically from China, Japan and Korea are applied to capital expenditure, for instance, infrastructure., etc. So, this kind of spending has its time lag with the growth of output and fuel the long-run economy.

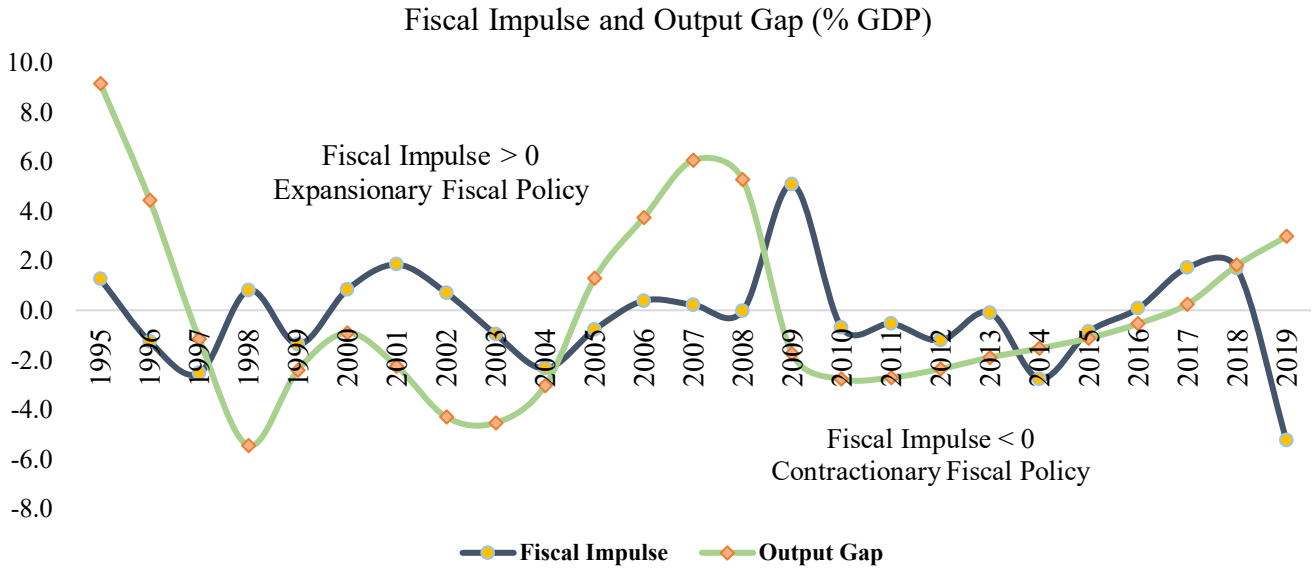
Exchange rate and export, on the other hand, display as the proxy variables. Exchange rate and export also have a positive correlation with output growth in Cambodia with mean (0.40) and (0.03), respectively. This implies that a 1 percentage change in the exchange rate and export cause output to increase 0.40 and 0.03, consecutively. The increase in exchange rate means that the depreciation of Khmer Riel would enhance the export growth and stimulate consumption since more than 80% of currency is transacted in the US dollar (NBC, 2019). The depreciation of Khmer Riel would enable the US dollar to appreciate which could encourage consumptions and investments. However, based on (NBC, Macroeconomic and Banking Assessment, 2019), the exchange rate between Khmer Riel and the US dollar is stable for the last few years around 4050 KHR/ USD. This means that the depreciation of Khmer Riel in a manageable rate could encourage growth by maintaining Cambodia's competitiveness and promote the external sector.

5. Fiscal policy and implementation

Fiscal policy in Cambodia has been consolidated and stabilized for the past two decades. RGC has pumped spending into the prioritized sector to stimulate economic growth, for example, the education sector, by promoting skill and human capital. Currently, the Skill Development Fund (SDF) and Entrepreneurship Development Fund (EDF) play a significant role to promote skill labor and help SMEs to fine-tune their business (ADB, 2018). Moreover, the government also injects spending into capital expenditure by building infrastructures and other project investments. Regarding of expenditure side, Revenue side also plays a major source of fund. By the meantime, RGC has implemented Revenue Mobilization Strategies (RMS) 2014-2018 (Finance, 2014) and continued to implement (RMS) 2019-2023 to make efficiency in tax collection and also to modernize the taxation system to ensure the sustainable and effective source of fund to manage the spending and also budget balance.

Based on Figure 7, it is seen that fiscal policy is more flexible and consolidated. In 2009, RGC executed expansionary fiscal policy by pumping the fiscal spending into the economy due to the effect of global financial crisis that put pressure on growth. In 2009, the budget proposed to be much more expansionary compared to 2008 to accommodate the spending into infrastructure, agriculture and social safety nets. Government has executed fiscal measures to incentivize producers and consumers and thus resuscitate the sluggish economy. Tax measures, moreover, have included the suspension on the monthly turnover tax of 1% on garment factory expenditures and extension of the profit tax holiday. RGC also announced to reduce in export management fees and other costs (Hossien Jailian, et at. 2009). Basically, RGC took an immediate action and policy response to garment, construction, tourism and social protection programs through fiscal incentives. In 2019, on the other hand, RGC implemented contractionary fiscal policy after an expansionary policy in 2018 and 2017 which mainly attributed to improve efficiency in budget management with FMIS and spending discipline. Fiscal year 2019 marks an unprecedented leap as the government implemented Budget System Reform Strategy (2018-2025) and rolled out five other major strategies envisaged public financial reforms in the medium term including Revenue Mobilization Strategy II (2019-2023), Public Procurement Management Reform Strategy (2019-2023), Public Debt Management Strategy (2019-2013), Subnational Budget System Reform Strategy (2019-2025), and Public Investment Management Strategy (2019-2025) (MEF, Cambodia Macroeconomic Monitoring, 2019).

Figure 7: Fiscal Policy Implementation



Source: Author's calculation

Based on BMA and MCMC output as well as the empiric data, it can be concluded that fiscal or government deficit associated with public debt are positive relationship with output growth. However, it does not always mean the increase in deficit and debt could encourage growth. RGC conducts the expansionary policy in recession period to stimulate the economy and bring it back to the potential growth while contractionary fiscal policy is implemented due to the economy is overheating which allows RGC has to cool down this dramatic expansion.

6. Conclusion and recommendations

Based on these two methodologies, the empirical results are identical. It reveals that fiscal deficit, public debt, foreign aid exchange rate, and export show a positive relationship with output in Cambodia. The study also confirms that fiscal policy in Cambodia is consolidated and stabilized during the cycle. The increase in fiscal deficit could be done to stimulate the economy during the downturn and recession period. The government injects liquidity through current expenditure or capital expenditure to push up the aggregate demand and generate additional output. Furthermore, public debt is one of the essential fiscal tools to behold the fiscal stance. The increase in public debt could be done to fine-tune the economy which represents expansionary fiscal policy. However, debt is not allowed to reach over its ceiling or target. Based on the empirical result, debt does not necessarily go up, however, the results confirm that the increase in public debt should be done during the recession period. Public debt might be narrow in good economic performance especially in overheating stage. Foreign aids also reveal its positive significant relationship with output. The increase in foreign aids also generates more additional domestic economy

through investments or fiscal incentives. Exchange rate and export, moreover have a positive correlation with the output which indicates that the depreciation of the exchange rate would encourage the level of competitiveness of the country and promote the domestic economy while an increase in export also triggers the aggregate demand and generate additional output in Cambodia.

Based on the above empirical results, this study suggests that the government should continue to implement the consolidated and stabilized fiscal policy. The fiscal authority must ensure its fiscal stance during the cycle. A fiscal policy stance should be adopted based on a specific situation. In other words, an expansionary policy should be done during the downtown or recession period while a contractionary should be considered to implement in an overheating economy as the government wants to cool down the economy. More than that, fiscal authority also ensures the level of fiscal deficit and public debt at a manageable level since these two variables play an important role in determining the fiscal space and fiscal stance during the cycle. Moreover, NBC and RGC should continue to ensure price stability to maintain the level of the exchange rate which encourages the country competitiveness which could be able to positively generate the output growth in Cambodia**.**

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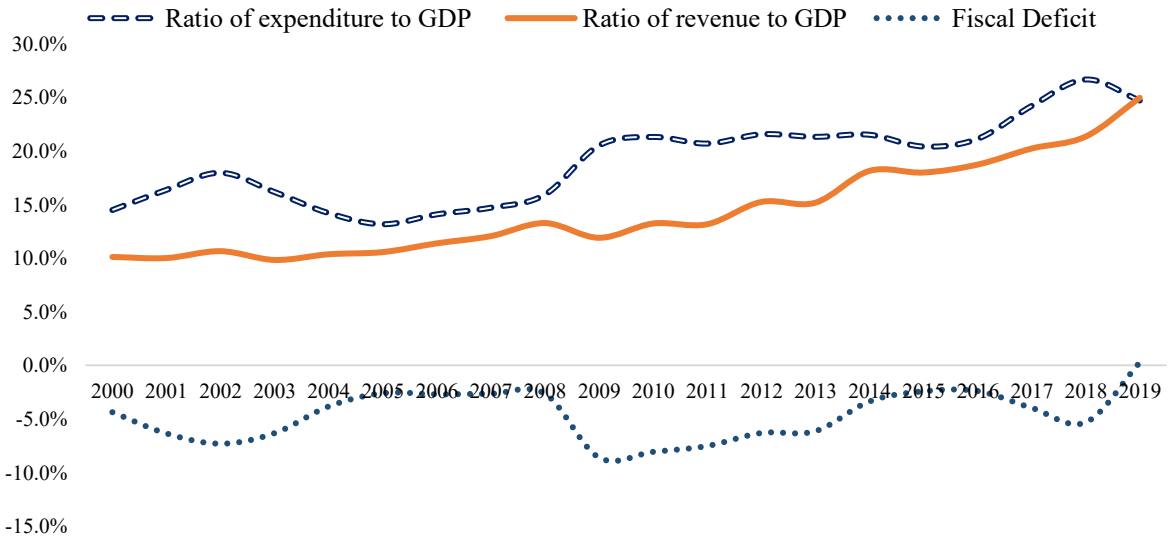
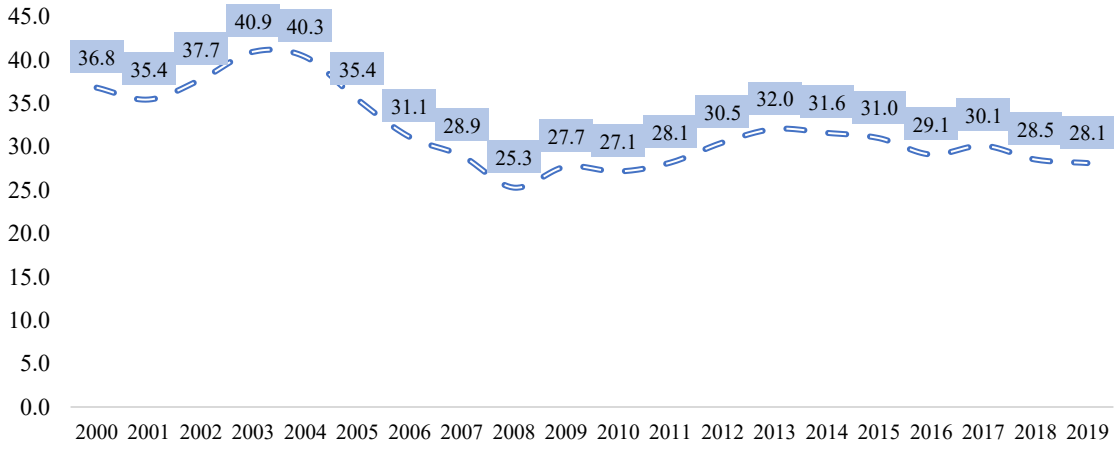
Appendix

Figure 1: Fiscal Deficit (2000-2019)



Source: MEF, 2020.

Figure 2: Debt to GDP ratio (2000-2019)



Source: MEF, 2020.