

THE SUSTAINABILITY OF FISCAL POLICY AND DEFICIT BUDGET FINANCING: EVIDENCE FROM SELECTED MUSLIM COUNTRIES

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Abstract

The sustainability of fiscal policy and how to finance the deficit budget has been receiving increasing attention from economists. The issue is paramount for the Muslim Countries and this is one of the motivations of the paper. In order to assess the sustainability of budget deficits in selected Muslim countries, a descriptive statistics for the stock of revenue, expenditure, tax over GDP and sustainability tests of government debt and deficit are performed for the Muslim countries for the 1971-2000 period. The cointegration model is also used to test the relationship between government expenditures, taxes, and seigniorage. The results show that the Muslim countries use taxes and seigniorage to finance their government expenditures. The empirical results also allow us to conclude that fiscal policy may be sustainable for most Muslim countries.

JEL classification: E60; H62; H63;

Keywords: deficit finance; inter-temporal budget constraint; fiscal policy; monetary policy; islamic countries.

INTRODUCTION

The fiscal deficits and the government debt in 1980's and 1990's have sharply increased, either in the developed and developing countries or countries in transition. Several Islamic countries which are known as countries in transition also have been exposed to the increasing amount of government debt and fiscal deficits. The increasing amount of government debt and the fiscal deficits are expected to pose a serious threat to the country's economic development. The high fiscal deficits must be financed either by borrowing or by printing money (seigniorage). The borrowing policy (i.e. deferred taxation) may redistribute during the lifetime the resources of the younger to the

older generations and from the unborn to current generations, cause financial crowding out of the private sector, and reduce the level of establishing domestic fixed capital.

When the government reaches the limit of the amount of the debt that the domestic private sector and the rest of the world absorb voluntarily, the monetization of the deficit is an alternative financial option. But, the expansion of money supply can increase the expected inflation rates, and hence, increase in the nominal interest rate, and depreciation of the national currency.

Several Muslim countries worry that a dramatic rise in the government debt derails the sound economic growth as has been seen in developed countries, including U.S.,

U.K., Germany and Japan. Although, in some Muslim countries like Bahrain and Oman, debt to the GDP, as reported in Table 1, are still lower than those of some developed economies most of which vary from

40% to 60%, as shown in Table 2. However, government debt, once it begins to accumulate, tends to surge continuously due to growing interest payment burden.

Table 1: Government Revenues, Expenditures, Debts, and Taxes in the Muslim Countries (as a % of GDP)

Country	Items	1971	1975	1980	1985	1990	1995	2000	Mean
Bahrain	Revenue	0.350	0.303	0.336	0.366	0.295	0.239	0.356	0.321
	Expenditure	0.132	0.264	0.274	0.370	0.318	0.270	0.259	0.269
	Debt	0.007	0.028	0.084	0.074	0.087	0.170	0.293	0.106
	Tax	0.160	0.144	0.044	0.075	0.076	0.077	0.070	0.081
Cameroon	Revenue	0.175	0.150	0.170	0.219	0.156	0.123	0.133	0.160
	Expenditure	0.188	0.178	0.164	0.209	0.213	0.120	0.132	0.171
	Debt	0.262	-0.006	0.217	0.176	0.359	1.320	0.908	0.501
	Tax	0.203	0.136	0.155	0.172	0.108	0.089	0.109	0.129
Guyana	Revenue	0.244	0.427	0.349	0.398	0.360	0.349	0.331	0.352
	Expenditure	0.308	0.475	0.601	0.791	0.698	0.400	0.427	0.529
	Debt	0.428	0.757	2.438	4.433	5.853	3.653	2.393	2.857
	Tax	0.222	0.403	0.297	0.411	0.000	0.000	0.014	0.190
Indonesia	Revenue	0.120	0.181	0.229	0.207	0.188	0.177	0.164	0.193
	Expenditure	0.145	0.205	0.238	0.211	0.184	0.147	0.178	0.192
	Debt	0.994	0.315	0.186	0.317	0.424	0.308	0.480	0.321
	Tax	0.510	0.227	0.218	0.180	0.178	0.160	0.144	0.176
Jordan	Revenue	0.158	0.218	0.196	0.218	0.279	0.291	0.255	0.231
	Expenditure	0.379	0.484	0.445	0.353	0.375	0.327	0.316	0.383
	Debt	0.349	0.414	0.377	0.555	2.051	1.038	0.951	0.819
	Tax	0.144	0.154	0.143	0.151	0.191	0.205	0.198	0.169
Malaysia	Revenue	0.187	0.229	0.261	0.272	0.248	0.229	0.196	0.220
	Expenditure	0.268	0.314	0.331	0.329	0.277	0.221	0.228	0.254
	Debt	0.470	0.488	0.434	0.817	0.795	0.411	0.374	0.472
	Tax	0.163	0.202	0.235	0.235	0.191	0.199	0.000	0.117
Oman	Revenue	0.401	0.495	0.388	0.516	0.354	0.280	0.240	0.382
	Expenditure	0.373	0.644	0.388	0.668	0.359	0.371	0.286	0.441
	Debt	0.006	0.199	0.083	0.250	0.197	0.291	0.191	0.174
	Tax	0.300	0.137	0.109	0.160	0.094	0.074	0.057	0.133
Pakistan	Revenue	0.145	1.275	0.156	0.163	0.192	0.172	0.164	0.324
	Expenditure	0.158	1.746	0.172	0.198	0.225	0.228	0.221	0.421
	Debt	0.517	6.632	0.550	0.763	0.910	0.751	0.893	1.574
	Tax	0.000	1.089	0.128	0.123	0.138	0.132	0.122	0.247
Sierra Lyon	Revenue	0.155	0.169	0.164	0.066	0.056	0.094	0.114	0.122
	Expenditure	0.166	0.274	0.289	0.132	0.083	0.163	0.279	0.208
	Debt	0.244	0.326	0.663	0.778	0.990	1.037	1.794	0.834
	Tax	0.160	0.146	0.148	0.059	0.059	0.090	0.071	0.106
Tunisia	Revenue	0.280	0.315	0.321	0.340	0.307	0.300	0.283	0.307
	Expenditure	0.274	0.327	0.324	0.365	0.346	0.327	0.317	0.326
	Debt	0.454	0.323	0.348	0.455	0.548	0.575	0.620	0.475
	Tax	0.235	0.257	0.245	0.244	0.240	0.250	0.258	0.247

Table 2: Government Debts of Four Advanced Countries (as a % of GDP)

Country	1971	1975	1980	1985	1990	1995	2000
United State	0.281	0.267	0.264	0.379	0.442	0.500	0.343
United Kingdom	0.583	0.506	0.463	0.466	0.334	0.467	0.000
Germany			0.271a	0.218	0.438	0.580	0.602
Japan		0.162	0.404	0.536	0.543	0.000	0.000

Notes: a = 1983

The increasing amount of government debt has produced raising concern about the sustainability of government deficits and fiscal consolidation. Already quite a lot of literature has studied the issue of fiscal sustainability. For example, Artis and Marcelino (1998), Athanasios and Sidiropoulos (1999), Baglioni and Cherubini (1993), Bohn (1995), Buiter and Patel (1992), Haug (1991), Makrydakias, Tzavalis and Balfoussias (1999). Since, this issue is paramount for the Muslim countries and this is one of the motivations of this paper.

The government revenues that come from taxes or seigniorage have important role to improve fiscal deficit. But, the excessive seigniorage may generate the problem to monetary sector. It implies that the expansionary of monetary policy may distort the economic activities. Hence, there is a need to harmonize the monetary and fiscal policies in order to balance between increasing taxes and price level.

Thus, the main purpose of this paper is to provide an overview of fiscal and monetary stance for the last three decades and the policy implications for fiscal consolidation by assessing fiscal sustainability and long run (cointegration) relationship in Muslim countries. The remaining discussion of this paper will be divided into four sections. Section 2 summarizes the theoretical framework, focusing on the present value budget constraint (PVBC) which forms the basis for stationary test of fiscal policy. The

tests of sustainability will be performed in Section 3. Historical facts about fiscal sustainability in the Muslim countries and the empirical test of the sustainability hypothesis and cointegration results are the main focus in section 4. And conclusion is given in section 5.

THE THEORETICAL FRAMEWORK

The writing about the public debt problem was first mentioned by Keynes (1923) in the beginning of the 1920s. He alerted to the need for the French government to conduct a sustainable fiscal policy in order to satisfy its budget constraint. Keynes also stated that the absence of sustainability would be evident when the government's liabilities have reached an excessive proportion of the national income.

In the current terms, sustainability is challenged when the debt-to-GDP ratio reaches an excessive value. There is a problem of sustainability when the government revenues are not enough to keep on financing the costs associated to new issuance of public debt. In other words, the sustainability issue becomes clear when the claims of the bond-holders are more than the taxpayers can support. At this stage, the government need to take measures that allow regaining the sustainability of fiscal policy, i.e., the government must come in due course to some compromise between increasing taxation, and diminishing expenditure, and reducing debt.

The renewed interest on this issue has encouraged researchers such as Blanchard et al (1990) to present a definition of sustainable fiscal policy. In the short-term, this policy allows the debt-to-GDP ratio returns to its original level after some excessive variation. Hence, for a fiscal policy to be sustainable, after having accumulated debt in the past, the government must run surpluses in the future.

In the following discussion, the definitions for fiscal policy sustainability will be presented. In every period, the fiscal sustainability that satisfies a static budget constraint can be written as:

$$B_t = (1 + r_t)B_{t-1} + D_t \dots\dots\dots (1)$$

where B_t is the government debt at period t , r is the discount rate, and D is the fiscal deficit.

Rewriting equation (1) for periods $t+1$, $t+2$, $t+3$, ..., and recursively solving that equation leads to the following inter-temporal budget constraint:

$$B_{t-1} = \sum_{j=1}^{\infty} \beta^{j+1} D_{t+j} + \lim_{j \rightarrow \infty} \beta^{j+1} B_{t+j} \dots\dots\dots (2)$$

where $\beta = 1/(1+r)$ and β^{j+1} is the discount factor applying between periods t and $t+j$. From equation (2), sustainability requires that the present value of future surpluses must exceed the present value of deficits by a sufficient amount to cover the difference between the initial debt stock and the present value of the terminal debt stock.

If the present value of the terminal debt stock is positive, equation (2) can be satisfied even if a government rolls over its debt in full every period by borrowing to cover both principal and interest payments. However, when the limit term is zero, this means that in the long run the government will have to stop using Ponzi games to finance fiscal deficits. Therefore, the government cannot roll over its debt in full every period.

$$B_{t-1} = \sum_{j=1}^{\infty} \beta^{j+1} D_{t+j} \dots\dots\dots (3)$$

Thus, a no-Ponzi game restriction is typically regarded as synonymous with sustainability, which implies that the transversality condition, $\lim_{j \rightarrow \infty} \beta^{j+1} B_{t+j}$, has to hold. In fact, this condition will hold as equality since individual investors cannot end up being indebted to the government, which means constraining the debt to grow no faster than the interest rate. Consequently, a sustainable fiscal policy has to satisfy the inter-temporal budget constraint (PVBC). That is, sustainability requires that an excess of future primary surpluses over primary deficits match the current stock of government debt in present value terms.

Fiscal sustainability can be used to in every countries can be reached with optimized the resource of taxes and seigniorage. It can be optimized if the distortionary cost for both of resources are minimized (Mankiw 1987). For this condition, every country must running the fiscal and monetary policy in one synchronization.

To understand the impact of monetary policy and fiscal policy for the budget deficit which financed by borrowing, the following approach of budget constraint will be used:

$$(G - T) = \Delta M / P \dots\dots\dots (4)$$

where G is the government expenditures, T is taxes, and $\Delta M / P$ is represents the amount of government spending that must be financed through creating more money or also known as seigniorage revenue. Hence, the seigniorage can be write as:

$$S_t = \Delta M / P = (M_t - M_t / P_t) \dots\dots\dots (5)$$

The equation of budget constraint will generate the implication that the present value of the revenues equals to government expenditures. To know weather budget constraint are running well, cointegration test

has done for a set of variables, that are: public expenditures (G), taxes (T), and seigniorage rate (S), with assumption of all variables are not stationer at level but stationer at first different. The function can be write as:

$$G_t = f(T_t, S_t) \dots\dots\dots (6)$$

Meanwhile to know weather fiscal policy and monetary policy done synchroni- zation, cointegration test has done for a set of variables, that are: public expenditures (G), taxes (T), and general price rate (P). The function can be write as:

$$G_t = f(T_t, P_t) \dots\dots\dots (7)$$

For the cointegration test, this study use the Johansen Cointegration Test and data is in the log data.

SUSTAINABILITY TESTS

We are now interested in the question of whether the creditors could rationally expect the government budget would be balanced in the present-value terms. If the PVBC holds for historical data, then the null hypothesis

$$\lim \beta^{t+j} B_{t+j} = 0 \dots\dots\dots (8)$$

will not be rejected in statistical tests.

Then, the appropriate sustainability test is to examine if the historical process that generate fiscal data is, as mentioned by Chalk and Hemming (2000), likely to result in the PVBC eventually being violated. If so, fiscal policy and thus the data generating process will have to be changed and current policy should be regarded as unsustainable.

Equation (2) is mathematically equivalent to equation (5), the model proposed for studying self-fulfilling hyperinflation and applied by Hamilton and Flavin (1986).

$$B_t = A_0(1 + r)^t - E_t \sum \beta^{t+j} D_{t+j} + \varepsilon_t \dots\dots\dots (9)$$

Where the operator E_t denotes the expectations of creditors and ε_t is the regression

disturbance term reflecting expected changes in real short-term interest rates, the term structure of long rates and measurement error. Hamilton and Flavin suggest that, for any stationary process for $(\varepsilon_t, E_t \sum \beta^{t+j} D_{t+j})$, when $A_0=0$, B_t will be station- ary, whereas $A_0 > 0$, B_t will not be stationary.

They also propose that the test to deter- mine whether $A_0=0$ is based on the obser- vation that if the process for the discounted sum of future deficits is stationary, then B_t is stationary if and only if $A_0=0$. It should be noted here that this is a sufficient but not necessary condition for sustainability, fiscal policy could be sustainable even if debt is nonstationary.

The annual data is used to test whether the bubble term turns out not to be zero and the hypothesis that fiscal policy should be regarded as sustainable. Our data- base includes the 57 Islamic countries, but lack of financial data restricts the analysis to about 10 countries. The data are compiled from International Financial Statistics and Government Financial Statistics and pub- lished by International Monetary Fund.

THE RESULT

This section will summarize the styl- ized facts about the fiscal policy sustainabil- ity in the Muslim countries and the empiri- cal test of the sustainability hypothesis. Fi- nally, the cointegration results will also be presented in this section.

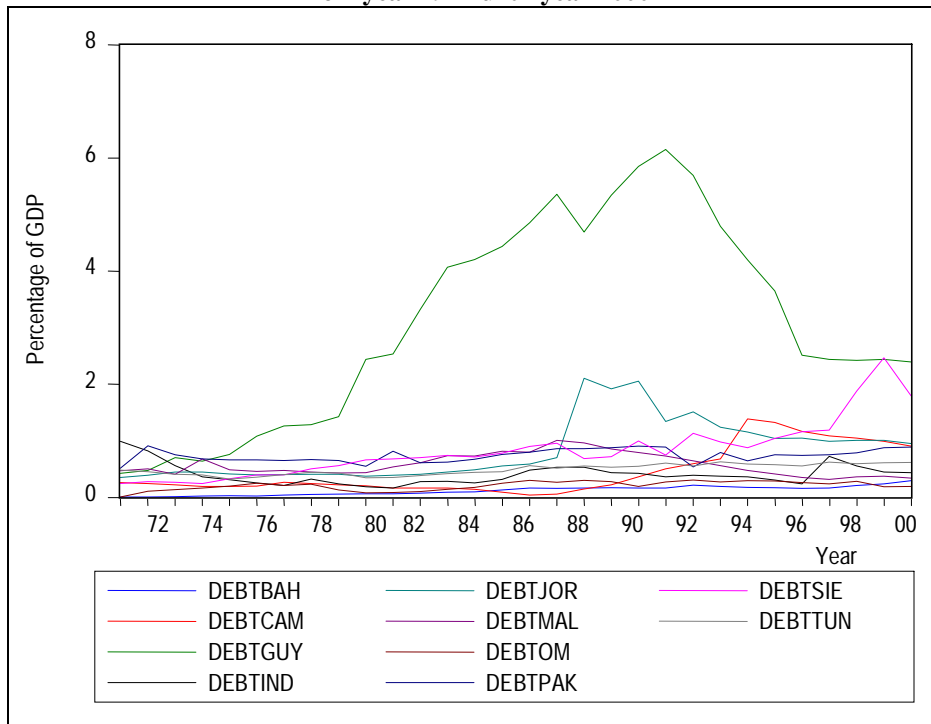
Some Stylized Facts

As reported in Table 1 (also see graph 1), between the ends of 1971s and the ends of 2000 there was an increasing trend of the debt-to-GDP ratio for most countries throughout the period. It can be divided in to two significant periods that are the period of year 1987-1992 and the period of year 1997-2000. This period shows that in generally, every ten years cyclically, the countries faced for the crisis of economic. For exam-

ple, public debt rose slightly in Bahrain from 0.7 per cent of GDP in 1971 to 29.3 per cent of GDP in 2000. Bahrain has the lowest debt-to GDP ratio among the countries. Cameroon, Indonesia, Jordan, Malaysia, Oman, and Tunisia have the moderate level of debt among that countries. The highest level of debt-to-GDP among them just between 90 per cent until 100 per cent. The highest reported debt-to-GDP ratios are in Guyana, Pakistan, and Sierra Lyon. The percentage of debt-to-GDP in Guyana rose

from 42.8 in 1971 to 585.3 in 1990 and become 615.2 in 1991, in Pakistan 663.2 in 1975, and in Sierra Lyon 247 per cent in 1999. But Guyana and Pakistan could maintain the debt successfully and reduced the debt until 239 per cent and 89.3 in the ends 2000 (eventhough this percentage still high). “Maastricht Agreement” (criteria for fiscal conferece of the Maastricht Agreement) the gross public debt notto exceed 60 per cent of GDP).

Graph 1: Percentage debt to GDP of ten Muslim countries from year 1971 until year 2000

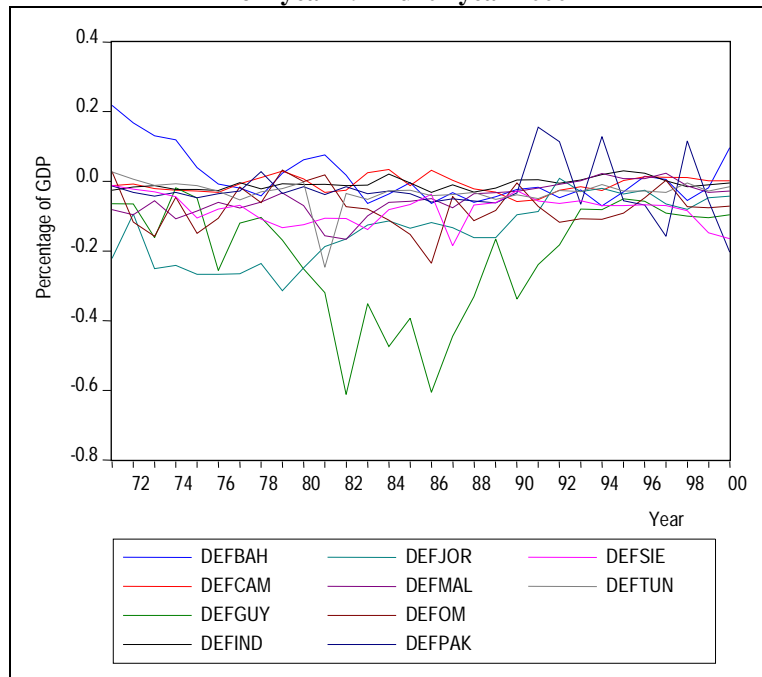


The percentage of government expenditure and revenue to GDP for each Muslim country is shown Table 1 (also see Graph 2 and Graph 3). The main conclusion is that the burden of public expenditures and revenues on GDP has increased since the 1970's for almost every country, except for Indonesia. Even, in year 1982 and year 1986 public expenditures in Guyana reach more than 100 per cent of its GDP. Also another obvious fact is that for most countries, the ratio of government expenditures to GDP exhibited a higher growth rate than the ratio of government revenues to GDP. That means, every country has the deficit budget. The highest deficit budget holds by Guyana

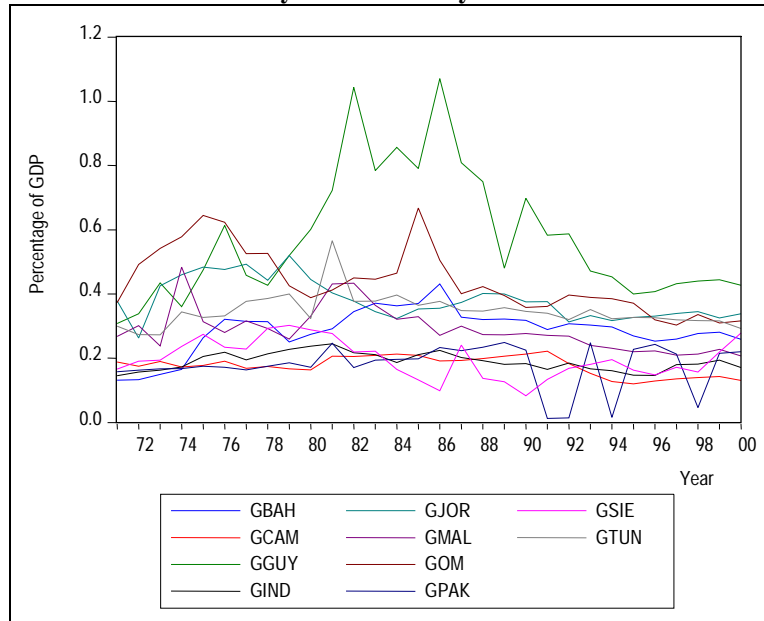
especially in the period of 1982-1986. This conclusion holds for all countries except for Bahrain and Cameroon.

Both the growth of seigniorage and taxes as the indicator of expansionary monetary and fiscal policies are shown in Graphs 4 and 5, respectively. Sierra Lyon shows the highest growth of seigniorage. It reaches the highest level 94 per cent of GDP in year 1982. Its mean Sierra Lyon gets the revenue from the monetary sector more than the fiscal sector. Mean a while, another 9 countries (which have the same volatility about the seigniorage policy) get the revenue from the fiscal sector more than the monetary sector.

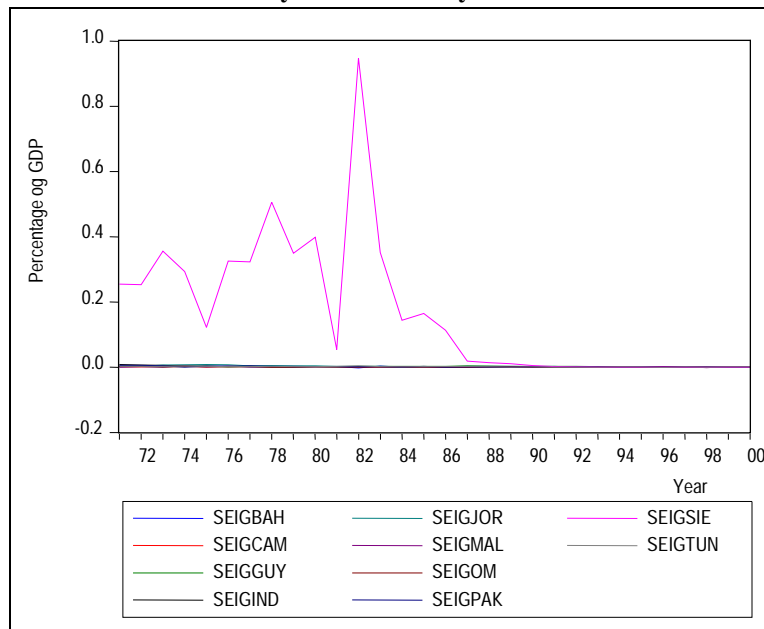
Graph 2: Percentage deficits over GDP of ten Muslim Countries from year 1971 until year 2000



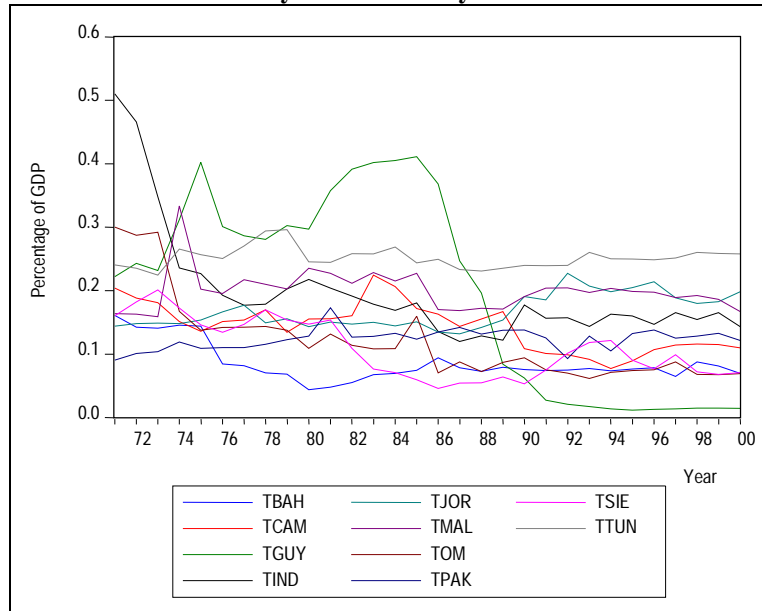
Graph 3: Percentage Government expenditures over GDP of ten Muslim Countries from year 1971 until year 2000



Graph 4: Percentage seigniorage over GDP of ten Muslim Countries from year 1971 until year 2000



Graph 5: Percentage taxes over GDP of ten Muslim Countries from year 1971 until year 2000



Sustainability Tests

The study of public debt (B) and budget deficit (D) stationarity for each Muslimic country will be explained below. Augmented Dickey-Fuller test and Phillip-Peron Test are used in the attempt to validate the sufficient sustainability condition. Table 3 and 4 give the stationarity tests results for the level of the public debt and budget deficit, with the sample period shown in column two. The critical 1 and 5 percent τ values with intercept are -3.75 and -3.00, respectively.

The results from the augmented Dickey-Fuller unit root tests are reported in

Table 3. The results show that the process (1-L)D is stationary in Cameroon, Guyana, Malaysia, Oman, Pakistan, and Tunisia. The process (1-L)B is stationary in Pakistan. Similarly, the Phillips-Perron test results are presented in Table 4, and also the summary in Table 5. The results show that the budget deficit and the debt are stationary in Cameroon, Guyana, Indonesia, Jordan, Oman, and Tunisia. However, in Malaysia only budget deficit is stationary, in Sierra Lion only debt is stationary, and in Bahrain and Pakistan budget deficit and debt is not stationary. In both cases, we can reject the hypothesis of a unit root at the 5% level.

Table 3: ADF Stationarity test for public debt and budget deficit

Country	Sample	Variable	ADF-Statistic	Intercept	Lag
Bahrain	1975 – 2000	(1-L)B	1.842405	0	3
		(1-L)B	-0.734056	1	3
		(1-L)B	-2.764973***	2	3
		(1-L)D	-0.932477	0	3
		(1-L)D	-2.073306	1	3
		(1-L)D	-4.062072*	2	3
Cameroon	1975 – 1999	(1-L)B	-0.241807	0	3
		(1-L)B	-1.631095	1	3
		(1-L)B	-2.818839***	2	3
		(1-L)D	-1.912982	0	3
		(1-L)D	-3.477302**	1	3
Guyana	1971 – 1979	(1-L)B	-1.224234	0	3
		(1-L)B	-1.823759	1	3
		(1-L)B	-3.227666**	2	3
		(1-L)D	-0.064202	0	3
		(1-L)D	-3.810427*	1	3
Indonesia	1977 – 2000	(1-L)B	2.228860	0	3
		(1-L)B	0.449734	1	2
		(1-L)B	-4.216108*	2	2
		(1-L)D	-2.418915	0	2
		(1-L)D	-1.538336	1	2
		(1-L)D	-3.937952*	2	2
Jordan	1971 – 2000	(1-L)B	-0.384790	0	3
		(1-L)B	-2.457954	1	3
		(1-L)B	-4.380202*	2	3
		(1-L)D	-2.692673	0	3
		(1-L)D	-2.499551	1	3
		(1-L)D	-3.043370**	2	3
Malaysia	1960 – 1999	(1-L)B	0.170079	0	3
		(1-L)B	-1.944593	1	3
		(1-L)D	-2.873152***	2	2
		(1-L)D	-2.525573	0	3
		(1-L)D	-3.308256**	1	3
Oman	1971 – 2000	(1-L)B	0.795445	0	3
		(1-L)B	-2.272315	1	3
		(1-L)B	-3.446169**	2	3
		(1-L)D	-1.936083	0	2
		(1-L)D	-2.936448**	1	3
Pakistan	1971 – 2000	(1-L)B	2.753442	0	3
		(1-L)B	3.530462*	1	3
		(1-L)D	-1.279260	0	2
		(1-L)D	3.530462*	1	3
Sierra Lyon	1974 – 2000	(1-L)B	2.593218*	0	3
		(1-L)D	4.566917*	0	3
Tunisia	1972 – 2000	(1-L)B	3.179721*	0	3
		(1-L)D	-1.162972	0	3
		(1-L)D	-3.884458*	1	3

Table 4: Phillip Perron Stationarity test for public debt and budget deficit

Country	Sample	Variable	PP-Statistic	Intercept	Lag
Bahrain	1975 – 2000	(1-L)B	2.282277	0	2
		(1-L)B	-2.475526	1	2
		(1-L)B	-6.071453*	2	2
		(1-L)D	-2.026824	0	2
		(1-L)D	-2.373377	1	2
		(1-L)D	-4.377638*	2	2
Cameroon	1975 – 1999	(1-L)B	0.028667	0	2
		(1-L)B	-3.809473 ⁺	1	2
		(1-L)D	-2.828303	0	2
		(1-L)D	-5.416784 ⁺	1	2
Guyana	1971 – 1997	(1-L)B	-0.361117	0	2
		(1-L)B	-3.616891 ⁺	1	2
		(1-L)D	-0.328635	0	3
		(1-L)D	-3.426923**	1	2
Indonesia	1977 – 2000	(1-L)B	1.712017	0	2
		(1-L)B	-4.219712**	1	2
		(1-L)D	-1.607843	0	2
		(1-L)D	-3.886435**	1	2
Jordan	1971 – 2000	(1-L)B	-0.444151	0	3
		(1-L)B	-7.529863**	1	3
		(1-L)D	-2.313562	0	2
		(1-L)D	-6.713696**	1	3
Malaysia	1960 – 1999	(1-L)B	0.561448	0	3
		(1-L)B	-2.618054	1	3
		(1-L)B	-7.872269*	2	3
		(1-L)D	-2.196555	0	3
		(1-L)D	-4.861753**	1	3
Oman	1971 – 2000	(1-L)B	-0.589227	0	3
		(1-L)B	-5.467690 ⁺	1	3
		(1-L)D	-2.790171	0	2
		(1-L)D	-7.579570 ⁺	1	3
Pakistan	1971 – 2000	(1-L)B	0.36223	0	3
		(1-L)B	1.299580	1	3
		(1-L)B	-8.880784*	2	3
		(1-L)D	-6.455610 ⁺	0	3
Siera Lyon	1974 – 2000	(1-L)B	1.007116	0	2
		(1-L)B	-3.712058 ⁺	1	2
		(1-L)D	7.039164*	0	2
Tunisia	1972 – 2000	(1-L)B	8.873310	0	3
		(1-L)B	-3.803570 ⁺	1	3
		(1-L)D	-3.482472	0	3
		(1-L)D	-11.67126 ⁺	1	2

Table 5: Summary of fiscal policy sustainability

Country	Period	Test Performed	Sustainability?
Bahrain	1971 – 2000	Deficit Public debt	No No
Cameroon	1971 – 1999	Deficit Public debt	Yes Yes
Guyana	1971 – 1979	Deficit Public debt	Yes Yes
Indonesia	1977 – 2000	Deficit Public debt	Yes Yes
Jordan	1971 – 2000	Deficit Public debt	Yes Yes
Malaysia	1971 – 1999	Deficit Public debt	Yes No
Oman	1971 – 2000	Deficit Public debt	Yes Yes
Pakistan	1971 – 2000	Deficit Public debt	No No
Sierra Lyon	1971 – 2000	Deficit Public debt	No Yes
Tunisia	1971 – 2000	Deficit Public debt	Yes Yes

Cointegration Test

The study of budget constraint and the fiscal and monetary policy harmonization/ synchronization stationarity and cointegration for each Muslimic country will be explained below. Augmented Dickey-Fuller test and Phillip-Peron Test are used in the attempt to validate the sufficient sustainability condition. Table 6 and 7 give the stationarity tests results for the level of the public government, taxes, general price rate, and seigniorage, with the sample period shown in column two. The critical 1 and 5 percent t values with intercept are -3.75 and -3.00, respectively.

The results from the augmented Dickey-Fuller unit root tests are reported in Table 6. The results show that the process (1-L)G is stationary in Bahrain, Guyana, Oman, Pakistan, and Tunisia. The process (1-L)T is stationary in Bahrain, Guyana, Indonesia, Oman, and Tunisia. The process (1-L)P is stationary in Bahrain, Guyana, Oman, and Tunisia. The process (1-L)S is stationary in Bahrain, Indonesia, Pakistan, and Tunisia. Similarly, the Phillips-Perron test results are presented in Table 7. The results show that the process (1-L)G, (1-L)T, (1-L)P, and (1-L)S are stationary in all Muslimic countries. Only Sierra Lyon, where the ((1-L)P is not stationary.

Table 6: ADF Stationarity test for Consumer Price (P), Government Expenditure (G), Tax (T), and Seigniorage (S), for period 1971-2000.

Country	Variable	ADF-Statistic	Intercept	Lag
Bahrain	(1-L)G	-5.895758*	0	3
	(1-L)T	0.016447	0	3
	(1-L)T	-3.408646**	1	3
	(1-L)P	-3.353142**	0	3
	(1-L)S	-3.220344**	0	3
Cameroon	(1-L)G	-1.756813	0	3
	(1-L)G	-1.859860	1	3
	(1-L)T	-2.301993	0	3
	(1-L)T	-2.054858	1	3
	(1-L)P	-1.997766	0	3
	(1-L)P	-2.032664	1	3
	(1-L)S	-1.756282	0	3
	(1-L)S	-2.350686	1	3
Guyana	(1-L)G	-0.449698	0	3
	(1-L)G	-2.284856***	1	3
	(1-L)T	-0.828258	0	3
	(1-L)T	-7.464759*	1	3
	(1-L)P	-3.509399**	0	3
	(1-L)S	-0.897320	0	3
	(1-L)S	-2.143715	1	3
	(1-L)S	-4.486080*	2	3
Indonesia	(1-L)G	-1.793896	0	3
	(1-L)G	-2.406949	1	3
	(1-L)G	-5.693968*	2	3
	(1-L)T	-0.095441	0	3
	(1-L)T	-2.801723*	1	3
	(1-L)P	0.210345	0	3
	(1-L)P	-2.513918	1	3
	(1-L)P	-3.773838*	2	3
	(1-L)S	-0.220492	0	3
	(1-L)S	-4.064832*	1	3
Jordan	(1-L)G	-1.783748	0	3
	(1-L)G	-2.654631	1	3
	(1-L)T	-2.466897	0	3
	(1-L)T	-2.122591	1	3
	(1-L)P	-1.826304	0	3
	(1-L)P	-2.061617	1	3
	(1-L)S	-2.444994	0	3
	(1-L)S	-2.227495	1	3
Malaysia	(1-L)G	-1.308157	0	3
	(1-L)G	-2.027921	1	3
	(1-L)T	-1.059867	0	3
	(1-L)T	-2.206626	1	3
	(1-L)P	-1.953926	0	3
	(1-L)P	-0.392338	1	3
	(1-L)S	-1.626999	0	3
	(1-L)S	-1.791065	1	3

Table 6: (Continued)

Country	Variable	ADF-Statistic	Intercept	Lag
Oman	(1-L)G	-3.278110**	0	3
	(1-L)T	-2.491894	0	3
	(1-L)T	-3.072949**	1	3
	(1-L)P	-2.050516	0	3
	(1-L)P	-6.024389*	1	3
	(1-L)S	-2.367708	0	3
	(1-L)S	-4.376554*	1	3
Pakistan	(1-L)G	-1.033039	0	3
	(1-L)G	-2.780485***	1	3
	(1-L)T	-1.975407	0	3
	(1-L)T	-2.108264	1	3
	(1-L)T	-3.122884**	2	3
	(1-L)P	-1.402089	0	3
	(1-L)P	-2.943044***	1	3
	(1-L)S	-4.929924*	0	3
Siera Lyon	(1-L)G	0.386529	0	3
	(1-L)G	-1.907237	1	3
	(1-L)T	-0.630104	0	3
	(1-L)T	-1.705748	1	3
	(1-L)P	-1.384853	0	3
	(1-L)P	1.193375	1	3
	(1-L)S	-1.308678	0	3
	(1-L)S	-2.571775	1	3
Tunisia	(1-L)G	-1.743968	0	3
	(1-L)G	-3.118122**	1	3
	(1-L)T	-1.740539	0	3
	(1-L)T	-2.460624***	1	3
	(1-L)P	-0.876141	0	2
	(1-L)P	-2.631310***	1	3
	(1-L)S	-1.929955	0	3
	(1-L)S	-4.487848*	1	3

Table 7: Phillip Perron Stationarity test for Consumer Price (P), Government Expenditure (G), Tax (T), and Seigniorage (S), for period 1971-2000.

Country	Variable	PP-Statistic	Intercept	Lag
Bahrain	(1-L)G	-4.144902*	0	3
	(1-L)T	-0.462882	1	3
	(1-L)T	-7.535731*	0	3
	(1-L)P	-4.867853*	0	3
	(1-L)S	-6.050878*	0	3
Cameroon	(1-L)G	-2.579630	0	3
	(1-L)G	-6.851433*	1	3
	(1-L)T	-1.442851	0	3
	(1-L)T	-3.512124**	1	3
	(1-L)P	-2.433250	0	3
	(1-L)P	-3.553941**	1	3
	(1-L)S	-3.519607**	0	3

Table 7: (Continued)

Country	Variable	PP-Statistic	Intercept	Lag
Guyana	(1-L)G	-0.585881	0	3
	(1-L)G	-3.533250**	1	3
	(1-L)T	-2.299329	0	3
	(1-L)T	-4.489466*	1	3
	(1-L)P	-1.434908	0	3
	(1-L)P	-3.951887*	1	3
	(1-L)S	-0.895421	0	3
	(1-L)S	-7.166092*	1	3
Indonesia	(1-L)G	-2.478036	0	3
	(1-L)G	-2.792937***	1	3
	(1-L)T	0.158506	0	3
	(1-L)T	-4.100942*	1	3
	(1-L)P	-1.232257	0	3
	(1-L)P	-3.875174*	1	3
	(1-L)S	-0.836362	0	3
	(1-L)S	-8.053125*	1	3
Jordan	(1-L)G	-2.877956***	0	3
	(1-L)T	-1.952122	0	3
	(1-L)T	-4.569516*	1	3
	(1-L)P	-2.765295**	0	3
	(1-L)S	-3.406466**	0	3
Malaysia	(1-L)G	-2.407693	0	3
	(1-L)G	-3.681126*	1	3
	(1-L)T	-2.233714	0	3
	(1-L)T	-3.439402**	1	3
	(1-L)P	-4.446500*	0	3
	(1-L)S	-4.911833*	0	3
Oman	(1-L)G	-3.278110**	0	3
	(1-L)T	-3.292740**	0	3
	(1-L)P	-3.976936*	0	3
	(1-L)S	-3.174096**	0	3
Pakistan	(1-L)G	-2.045417	0	3
	(1-L)G	-9.974759*	1	3
	(1-L)T	-4.241630*	0	3
	(1-L)P	-2.826197***	0	3
	(1-L)S	-4.361661*	0	3
Siera Lyon	(1-L)G	0.430285	0	3
	(1-L)G	-5.462715*	1	3
	(1-L)T	-0.003151	0	3
	(1-L)T	-3.123428**	1	3
	(1-L)P	0.442353	0	3
	(1-L)P	-2.167158	1	3
	(1-L)P	-6.780989*	2	3
	(1-L)S	-3.219976**	0	3
Tunisia	(1-L)G	-3.270908**	0	3
	(1-L)T	-3.544572**	0	3
	(1-L)P	-1.081631	0	3
	(1-L)P	-8.439226*	1	3
	(1-L)S	-4.088577*	0	3

The results of the cointegration test are reported in table 8 and 9. Cointegration test for Bahrain, Jordan, Oman, dan Pakistan shows that there are cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and seigniorage rate (LS) and also in a set variables: public expenditures (LG), taxes (LT), and general price rate (LP). This finding can explain that current expenditures are equal with current revenues which come from taxes and seigniorage. That's mean in the long run, government expenditures will not influence the government revenues negatively. Also fiscal and monetary policy run in synchronization. The positive relationship between tax and government expenditures shows that the increasing in government expenditures will increase the tax.

The cointegration test for Guyana and Tunisia shows that there are no cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and seigniorage rate (LS) but there are cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and general price rate (LP). This finding can explain that current expenditures are not equal with current revenues from taxes and seigniorage. It's also implies that, in the long run, government expenditures will influence the gov-

ernment revenues negatively but fiscal and monetary policy run in synchronization.

While, the cointegration test for Indonesia and Sierra Lyon shows that there are no cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and seigniorage rate (LS) and also in a set variables: public expenditures (LG), taxes (LT), and general price rate (LP). This finding can explain that current expenditures are not equal with current revenues from taxes and seigniorage. Therefore, in the long run, government expenditures will influence the government revenues negatively. Also fiscal and monetary policy do not run in synchronization.

The cointegration test for Malaysia shows that there are cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and seigniorage rate (LS) but there are not cointegration relationship in a set variables: public expenditures (LG), taxes (LT), and general price rate (LP). This finding can explain that current expenditures are equal with current revenues from taxes and seigniorage. Hence, in the long run, government expenditures do not influence the government revenues negatively. Also fiscal and monetary policy do not run in synchronization.

Table 8: Cointegration Test of Budget Constraint

Country	Maximum Eigenvalue		Trace Test	
	Statistic Test		Statistic Test	
	Null ($r = 0$)	Null ($r \leq 0$)	Null ($r = 0$)	Null ($r \leq 0$)
Bahrain	0.496781*	0.333107	30.69016*	11.46171
Cameroon	NA	NA	NA	NA
Guyana	0.391078	0.347974	26.99619	13.10637
Indonesia	0.491234	0.195857	25.54299	6.621505
Jordan	0.826930**	0.356947*	67.22351**	18.10987*
Malaysia	0.574472*	0.203855	35.18602*	11.26212
Oman	0.588010**	0.391704**	46.33719**	21.50802**
Pakistan	0.482105**	0.385805**	42.25152**	23.82799**
Siera Lyon	0.468703	0.263413	26.45582	8.747659
Tunisia	0.439991	0.333495	29.53964	13.30517

Table 9: Cointegration Test of Fiscal and Monetary Policy Synchronization

Country	Maximum Eigenvalue		Trace Test	
	Statistic Test		Statistic Test	
	Null ($r = 0$)	Null ($r \leq 0$)	Null ($r = 0$)	Null ($r \leq 0$)
Bahrain	0.591923**	0.556470**	47.86712**	22.77074**
Cameroon	NA	NA	NA	NA
Guyana	0.505289*	0.230299	32.09302*	12.38712
Indonesia	0.511436	0.280446	29.28830	9.232337
Jordan	0.792307**	0.519922**	67.52868**	23.52130**
Malaysia	0.459743	0.222014	29.67134	12.43146
Oman	0.530704**	0.525439**	48.93765**	27.75503**
Pakistan	0.685157**	0.375527*	51.97991**	19.62086*
Siera Lyon	0.273664	0.188056	14.89927	5.946463
Tunisia	0.723955**	0.330778*	52.23478**	16.19339*

CONCLUSION

In this paper, the government budget constraint is the key element of the fiscal policy sustainability analysis and also the starting point to derive analytical formulations suitable for empirical testing. Through stationarity test for the of public debt and budget deficit and descriptive analysis of government revenues, expenditures, and taxes, an attempt was made to assess the sustainability of fiscal policy in some muslim countries, for the 1971–2000 period. The

stationarity of the level difference of the public debt and budget deficit is a sufficient condition for fiscal policy sustainability. The cointegration results show that, first, in Bahrain, Jordan, Oman, and Pakistan, the budget constraint has cointegration relationship in the long run. The fiscal and moneter policy could also be synchronizely applied. Second, in Indonesia and Sierra Lyon, neither budget constraint nor fiscal and moneter policy have cointegration relationship.

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