Which type of government revenue leads government expenditure?

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Abstract

This Malaysia is a developing Islamic state that faced government budget deficit since 1998. It is undeniable that a budget deficit or inability to cover government spending is not positively seen by external parties. The optimum level of government budget is the state where government spending is totally offset by government revenue and that can be achieved through an increase in tax revenue or decrease in spending. The paper aims to discover the existence of a theoretical relationship between government spending and the different types of government revenues namely direct and indirect taxes and non-tax revenues. Furthermore, the paper tries to find out which of the different government revenues leads government spending. As well as to discover each revenue structure relationship with government spending using sample data from Malaysia for the period of 1970-2013 and time series techniques. The paper found out that although majority of government revenue is from direct tax revenue, the government spending only varies due to a change in indirect government tax revenue and non-tax revenue. In addition, it discovered that there is a long run relationship between the variables and that direct tax and government spending are endogenous (follower) variables, while non-tax revenue and indirect tax are exogenous (leader) variables. The paper also discussed the necessity of tax reform in Malaysia, since inefficiency in direct tax revenue leads to a dependence on non-tax revenue and regressive indirect taxes.

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Which type of government revenue leads government expenditure?

Introduction: The issue motivating the paper

Malaysia is a small country with big achievements in economic development. Starting as a low-income country in 1957 it had slowly increased its standard of living to middle income class, its capita income rose throughout the years. Their Economic accomplishments as well as other reasons mentioned in the following paragraphs are the reasons why Malaysia was used for this papers discussion.

Malaysia took the chairmanship of the Organization of the Islamic Conference (OIC) in 2003 till 2008; this organization coherent Muslim opinion on issues affecting the Islamic States. In 2015 Malaysia is undertaking the Chairmanship of the Association of Southeast Asian Nations (ASEAN) which one of its goals is to accelerate the economic growth, social progress and cultural development in the region thus making it the best candidate for this paper.

Government revenue in Malaysia is divided into three main categories direct taxes, indirect taxes and non-tax revenues. Taxation is a crucial element in any country sustainability, growth and development and especially in the case of Malaysia where tax revenues dependency by the federal government represents 81% of the total revenue. However, we believe that the different types of taxes impact growth and Government budget differently. Hence, the paper tries to discover which type of tax and non-tax revenues is most efficient and effective in achieving their Macro objectives. In other word, the paper tries to determine the type of revenue the government can manipulate to control government budget and maintain it at a balance.

Economists have always argued on the notion of increasing government spending will increase growth and development, some are with it, some are against it in favor of leaving growth to the economic agents and the market. However, Malaysia uses its

fiscal policies to decrease the deficit by increasing tax or reducing government spending. Interestingly, it's theorized that increasing tax rate may not be the most efficient way to achieve that and will end up reducing total tax revenue.

Unlike the previous studies which focused exclusively on the tax and spend experience causality in general, the present study differs from the previous in respect of breaking down the different government revenues into its types (direct taxes, indirect taxes and non-tax revenues) and attempt to investigate the causality between these variables and government spending. Besides, the study is extended to 44 years from 1970 t0 2013. Furthermore, The paper compares the findings derived from the study with the tax forms in the early Islamic era, which were considered the ideal tax policy in that period of time.

The paper tries to identify the existence of a potential relationship between the types of government revenues (direct tax, indirect tax and non-tax) and spending using time series technique rather than regression analysis due to the inherent unrealistic assumptions of ordinary least square regression analysis such as the believe that all variables are stationary or constant in the mean, variance and co-variance. In addition, the study humbly attempt to discover which variable is endogenous (follower) and which one is an exogenous (leader) to enable Malaysian Government to manage their ongoing budget deficit since 1998 by shocking the proper type of revenue. We mainly focus in this study the impact of the three types of revenues on spending, although we acknowledge that there might be bi-directional relationship.

Literature Review

Nyamongo et al. (2007) found that government revenue and expenditure are co-integrated, and a long-run relationship exists between them as well as a bidirectional causality, which supports the fiscal synchronization hypothesis. However, in the short-run no causality was found suggesting fiscal neutrality hypothesis in South Africa for the period of study. Tsen and Kian-Ping (2005) results supported tax-spend hypothesis in the case of Malaysia.

Amoah and Loloh (2008) found that revenue and expenditure are co-integrated. In addition, the study found a long-run causality exists that supports the spend-tax hypothesis while the short-run causality supports the tax-spend hypothesis in Ghana.

Sadiq (2010) on the other hand, found no causality between the government spending and revenue in Pakistan which supports the fiscal neutrality. As well as Jalil (2012)

found no causality between revenue and expenditure in Penang and Narayan P. K. & Narayan S. (2006) found neutrality relationship in Guatemala , Peru, South Africa, Uruguay and Ecuador.

Moalusi (2004) and Keho (2010) suggested that decreasing taxes is considered as an appropriate policy against budget deficit. However in contrast, Buchanan & Wagner (1978) proposed that increasing tax revenues is the better solution.

Wolde-Rufael (2008) found a unidirectional causality from revenue to expenditure for Ethiopia, Ghana, Kenya, Nigeria, Mali and Zambia and a bi-directional causality between expenditure and revenue for Mauritius, Swaziland and Zimbabwe. Dalena&Magazzino (2012) found a unidirectional causality from public revenues to public spending in Italy. In addition, Burkina Faso Li (2001) found that bidirectional causality exists in China. Konukcu-Önal&Tosun (2008) found that a bidirectional causality exist in the Kyrgyz Republic and Kazakhstan.

The Objective of the Study

The specific objectives of this research is to find out the possible existence of a theoretical relationship between types of government revenues and government spending in Malaysia, in order to derive policy that may help to reduce the on-going budget deficit in Malaysia. The paper tries to discover, which type of the three government revenue influences government spending. Additionally, the paper humbly propose the type of revenue structure to focus on to attain sustainability and balance between government revenue and spending.

Theoretical Underpinnings

The relationship between government spending and revenues has been discussed extensively and theorized by economists and policy makers. However, the debate on the link between them remains till this day.

Tax is argued to encourage savings and help with the redistribution of wealth through the progressive tax system. It applies on specific or a set of individuals, corporations and economic activities. Malaysia tax structure is identified either progressive tax or regressive tax. A new tax worth mentioning called the Goods and the Malaysian

government introduces Services Tax (GST) and it is to be implemented in 2015. GST is a consumer tax based on expenditure and is considered to be a progressive tax.

The federal Government has a high dependency on income tax revenue (amounted to 58% of total revenue in 2013) and oil revenue (30.6% of total revenue for 2013). In the past few years, it had budgeted to increase tax revenue even though there was a reduction in tax rates. Based on researches, there are three hypotheses that describe the relationship between tax and spending, these are tax-and-spend, spend-and-tax, fiscal synchronization and fiscal neutrality.

Tax and spend hypothesis was first introduced by Friedman (1978); it suggests that there is a positive link between government spending and revenue. Spend and tax hypothesis suggest that spending causes revenue and the fiscal synchronization hypothesis states that there is bidirectional causality between spending and revenue through simultaneous decision-making. Fiscal neutrality was first proposed by Baghestani and McNown (1994) and suggests that revenue and spending are not linked to each other.

Researchers and scholars tried to determine a general rule of the Government revenue and spending relationship. However, up until now this issue was unresolved and the relationship is highly subjective. Therefore, we would also like to investigate this relationship in the case of Malaysia. Which is highly crucial for policymakers due to the long-term of Malaysia budget deficit.

Government Revenue Structure Analysis in Malaysia

General revenue

The Data shows that from 2000-2013 the highest proportion of revenue is derived from Direct Taxes, while the differences in the values of Indirect and Non-Tax revenue are quiet undistinguishable. However, on average the Direct Taxes constitutes 51.75% of overall revenue, while on average the Indirect Taxes represents 26.66% and Non-Tax Revenue 21.59% of the overall Government Revenue During the period of crisis Direct Taxes portion stayed stable , while on average Indirect taxes reduced and Non-Revenue Taxes had insignificantly increased.

As shown in the Graph the direct tax had dominated the overall government revenues by far and was significantly higher than 50% from 2008 to 2013. Additionally, the Non-taxes was lower than the indirect taxes in the early period, however since 2013

on average the non-tax revenue was greater than the indirect taxes and even stayed stable during Asian crisis (2007) and Financial crisis (2008). The only impacted form of tax was the indirect taxes, which significantly lowered and showed a declining pattern since 2005.

5.1.1 Direct Taxes
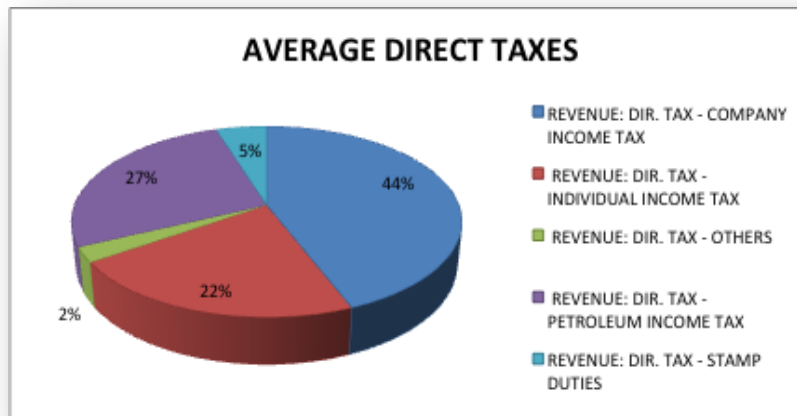
Direct taxes are imposed on individual or companies, this type of tax cannot be shifted to another individual or entity. The major share of direct taxes in Malaysia is attributed to company income tax; around 43% on average of the overall direct revenues is derived from tax imposed on companies. Tax imposed on petroleum and individual income also play a significant role as the generate on average 27% and 23% respectively from the overall direct tax revenues, a very small portion is derived from stamp duties 5% and others direct taxes 2%. The individual tax income was very significant in the first quarter of 2009, however in every fourth quarter of 2009, 2010, 2011 2012 and 2013 the individual tax income have shown a negative amount. The company tax income has an unpredictable pattern, it increases and decreases over time, and the highest share of company income was on the fourth quarter of 2013.

Indirect Taxes

INDIRECT TAX REVENUE
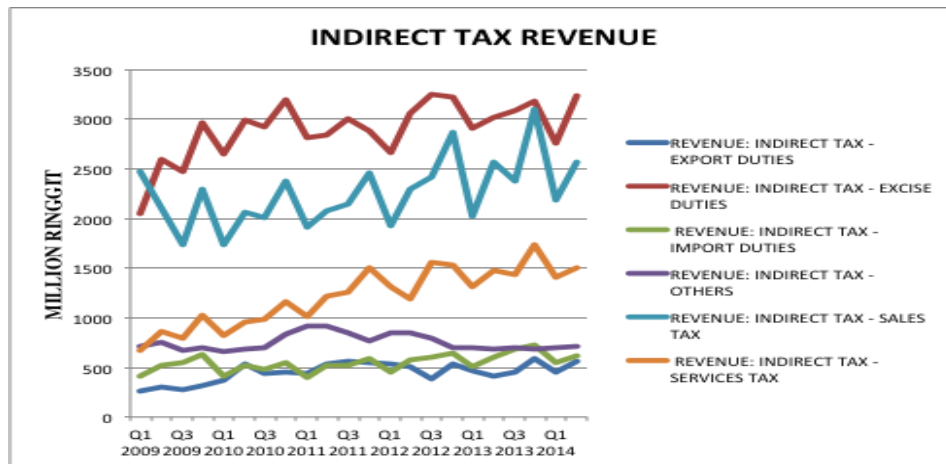
The highest revenue of the indirect taxes on average was derived from excise tax 35.7%, while sales taxes was 27.8% of the overall indirect taxes the shares of service tax, import duties , export duties were 14.9%, 6.8% 5.5% respectively. However, 9.3% was derived from other indirect taxes imposed indirectly on the population. Referring to the Table above we can notice that excise duties and sales tax have higher fluctuations compared to other taxes, while import and export duties are shown a more stable pattern and services tax shows an upward trend, as it increasing with and insignificant drops in certain periods.

Non-Tax Revenue

The Malaysian Government Non-tax revenues include fees for issue of licenses and permits, fees for specific services, proceeds from sale of government assets, rental of government property, bank interests, returns from Government investments (including gains from sales of investments) fines and forfeitures. Non-revenue receipts consist of repayments and reimbursements such as refunds of overpayments in previous years and repayment of loans from the Federal Government's Consolidated Fund (Revenue Account) received from other Federal Government Agencies and State Governments.
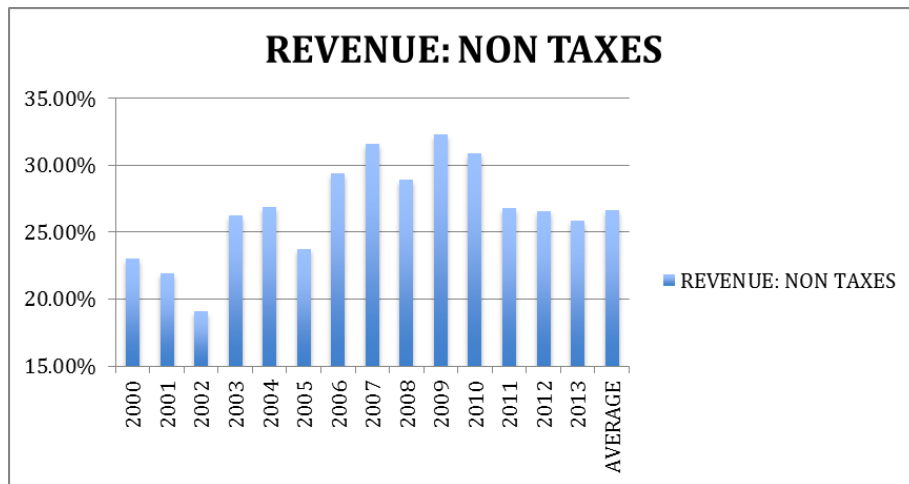
REVENUE: NON TAXES

The non-tax revenue was quiet stable and was on average 27% through the whole sample period. The tax revenue was at peak during crisis but had marginally declined after crisis to a stable state.

Data and Methodology

The paper used to analyze the co-integration and causality between the different tax forms and government spending, yearly data from the DataStream provided by the Malaysian Bureau of Statistics. The sample used for study is from the period 1970 to 2013 with 43 observations on each variable. The variables under study are Direct Tax Revenues (DTAX), Indirect Tax Revenues (IDTAX), Non-Tax Revenues (NONTAX) and Government Spending (SPENDING). The variables are transformed into Log form and Differentiated Form to further the study. We used Johansen co-integration test to discover if the variables are theoretically related. We also used Vector Error Correction Model (VECM) to differentiate the exogenous variable from the endogenous. The extent of endogeneity and exogeneity was further unveiled by VDC vector decomposition method. Finally, Long-run structural modeling was used to figure it out the relationship between Government Spending and the types of Government Revenue, while taking arbitrary Government spending as dependent variable. The reason is that we would like to find out the impact of the government revenues types on Government Spending.

Results and Interpretations

7.1 Unit root Test

Majority of the researchers believe that Macroeconomics Time Series variables are not stationary rather they are stationary with a deterministic trend. They agreed that non-stationary variables have an R-square results or outcome are biased. In other words, non-stationary variables will provide spurious relationships and the results will be misleading and differ from the conventional theory. Therefore, before going far in our results, we checked the stationary of the variables using Augmented Dickey-Fuller test (ADF), Phillip-Perron test (PP) and Kwiatkowski et al. test (KPSS).

Augmented Dickey Fuller (ADF) Test

In conducting ADF test we were required to transform the variables into level form and differenced form. To ensure the credibility of the long relationship among the variables, the variables must be non-stationary at level form and stationary at differenced form. Stationary tests for the first difference of the Direct Tax Revenues, Indirect Tax Revenues and Non Tax Revenues and Government Spending indicated that it was I(1).

Table 1: ADF tests for Level and Differenced form

38 OBSERVATIONS CV 95%			
LEVEL FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
LSPENDING	-2.6578	-3.635	VARIABLE IS NON-STATIONARY
LDTAX	-3.0201	-3.635	VARIABLE IS NON-STATIONARY
LIDTAX	-3.1988	-3.6589	VARIABLE IS NON-STATIONARY
LNONTAX	-2.0814	-3.6589	VARIABLE IS NON-STATIONARY
DIFFERENCE FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
DSPENDING	-5.3195	-2.8738	VARIABLE IS STATIONARY
DDTAX	-4.2898	-2.8738	VARIABLE IS STATIONARY
DIDTAX	-2.4209	-1.9636	VARIABLE IS STATIONARY
DNONTAX	-4.8698	-2.8738	VARIABLE IS STATIONARY

In conducting our ADF test we have referred to the results that includes an intercept and a linear trend, we have looked at the highest AIC and SBC and made our decision by comparing their respective absolute value t-statistics with the critical value. We assume the null hypothesis that the variables are non-stationary, while our alternative hypothesis indicates the variables are stationary. We found out that all our four

variables are non-stationary at the level form, therefore accepting our null hypothesis at 95% confidence level. On the other hand, it is also required that our differenced form of variables to be non-stationary, in order to proceed with the co-integration test. It is required that differenced form of variables to have a constant mean, variance and co-variance. However, this removes effectively the theoretical or the long run relationship of the variables and test only for cyclical or seasonal effects (short-term). By referring to the results indicating that the regression includes an intercept but not a trend, we found out the highest SBC and AIC Test-Statistics values are greater than the critical value. This shows that all the variables are non-stationary in their differenced form with a 5% significance level.

Phillips Perron Test

In order to strengthen the unit root test, we have also conducted Phillips-Perron to ensure that our variables are I (1), in other words we need to only the variables once to make it stationary. Phillips-Perron test differs from ADF test in terms of considering both autocorrelation and heteroskedasticity, while ADF only takes into consideration Autocorrelation.

Table 2: Phillips-Perron test

43 OBSERVATION (95% CV)			
LEVEL FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
LSPENDING	-2.5778	-3.5868	VARIABLE IS NON-STATIONARY
LDTAX	-2.0864	-3.5868	VARIABLE IS NON-STATIONARY
LIDTAX	-2.1901	-3.5868	VARIABLE IS NON-STATIONARY
LNONTAX	-1.8591	-3.5868	VARIABLE IS NON-STATIONARY
DIFFERENCE FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
DSPENDING	-5.8019	-2.8818	VARIABLE IS STATIONARY
DDTAX	-5.0811	-2.8818	VARIABLE IS STATIONARY
DIDTAX	-6.1483	-2.8818	VARIABLE IS STATIONARY
DNONTAX	-8.9507	-2.8818	VARIABLE IS STATIONARY

Similar to the requirement of the ADF test variables must be non-stationary at level form and non-stationary at difference form. Additionally, the null hypothesis for PP test is that variables are non-stationary, while the alternative states that the variables are stationary. We also found that all the variables test-statistics were lower than the

critical value in their level formed, while the variables t-statistics where higher than the critical values in their differenced form. Therefore, we can assume that with a significance level of 5% that the variables are stationary in their differenced form and non-stationary in their level form.

KPSS

It is widely acknowledged that ADF and PP tests are not very efficient in distinguishing between a unit root and a near unit root case. Therefore, to complement ADF and PP tests, we employed the KPSS test proposed by Kwiatkowski et al. (1992). The KPSS test assumes that the null hypothesis is stationary against the alternative that the variables do have a unit root3.

Table 3: KPSS test

44 OBSERVATIONS (95% CV)			
LEVEL FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
LSPENDING	0.12437	0.19653	VARIABLE IS STATIONARY
LDTAX	0.15669	0.19653	VARIABLE IS STATIONARY
LIDTAX	0.15873	0.19653	VARIABLE IS STATIONARY
LNONTAX	0.12799	0.19653	VARIABLE IS STATIONARY
DIFFERENCE FORM			
VARIABLE	TEST-STAT.	CRITICAL.VALUE	IMPLICATION
DSPENDING	0.25783	0.38443	VARIABLE IS STATIONARY
DDTAX	0.31132	0.38443	VARIABLE IS STATIONARY
DIDTAX	0.38515	0.38443	VARIABLE IS NON-STATIONARY
DNONTAX	0.21122	0.38443	VARIABLE IS STATIONARY

From the results shown above, we found that at 5% significance level that all the variables are stationary at the level form without exception; therefore we accept the null hypothesis at 95% confidence level. On the other hand, the results suggest that with the exception of IDTAX (Indirect Tax Revenue) that the variables are still stationary at differenced form. Therefore, Government Spending, Direct Tax Revenue and Non-Tax Revenues may not have a unit root.

Lag order Determination

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[3]http://www.jimsjournal.org/11%20Loganathan.pdfa

The next requirement prior of testing a long-run relationship between Government Spending and the different types of Government Revenues (direct Taxes, Indirect Taxes and Non-Tax revenues) is to determine the number of lags that can be used to address Autocorrelation problems and this process is called Vector Auto Regression (VAR) order determination.

We select the order of the VAR model on the basis of three criteria first alternative is to look at the order with the highest AIC (Akaike Information Criterion), the second option is to look at the order with the highest SBC (Schwarz Bayesian Criterion) and another option might be to look at the p-value.

The results might be conflicting and each option may give a different order. A higher order addresses autocorrelation issues and is preferable when longer time series are available since a reduction in the number of observation may not be a problem. Nevertheless, a lower order is preferable when there is only short number of observations or (short time series) and autocorrelation is inexistent to avoid over-parameterization.

Table 4: Lag Order

37 OBSERVATIONS			
CHOICE OF CRITERIA			
OPTIMAL LAG	AIC	SBC	p-Value	C.V.
ORDER	0	0	[1.00]	5%

In the above table we found out that, the only significant result is when there is no lag or that the VAR order is zero. Both SBC and AIC indicate also zero as the optimal lag order. However, according to consensus a lag order of 1 or 0 may not give reliable results of the vector error correction model, Microfit will only provide the error correction term and not other results.

Therefore we arbitrarily have taken 2 as the optimal lag order, however before we proceed to the cointegration test, we have conducted an autocorrelation test to ensure the viability of the lag order number. The existence of autocorrelation may hinder the results, since the numbers of observations are only 37 and the risk of over-parameterization is highly probable.

Table 5: Test for Variables test of Serial correlation

LAG ORDER 2		
TEST OF CORRELATION		
VARIABLE	CHI-SQ (P-VALUE)	IMPLICATION AT (5%) LEVEL OF SIGNIFICANCE
DSPENDING	[0.521]*	NO SERIAL CORRELATION
DDTAX	[0.487]*	NO SERIAL CORRELATION
DIDTAX	[0.309]*	NO SERIAL CORRELATION
DNONTAX	[0.061]*	NO SERIAL CORRELATION

However, as shown in the table above there is no serial correlation in all equations. On the basis that the null hypothesis indicates the inexistence of serial correlation and alternative assumes the opposite. We accept the null hypothesis since all the variables p-values are significant at 5% significance level. In sum, there is no indication of serial correlation, therefore we proceed with we proceed with lag order 2 as our optimum order.

Cointegration Tests

Cointegration is a test used to determine the correlation between non-stationary time series variables in the long run. We identified that the variables where non-stationary at the level form, thus if any linear combination of them is stationary, then we can conclude that the time series variables are cointegrated and have long-run (theoretical) relationship. To test the relationship between government spending and the types of government revenues is not spurious or simply by accident, we have conducted three different cointegration methods.

Engle Granger Test

Granger (1969) proposes the concept of cointegration and, Engel and Granger (1987) provide further in depth discussion of the technique. The test is used to identify if the non-stationary variables are stationary when combined together. We constructed four different linear equations that comprise all the variables to identify if they are stationary when combined.

We test on the basis that we accept null hypothesis at 95% confidence level (T-statistics< critical value) if there is no cointegration or long-term relationship is inexistent. Nonetheless, we reject the null hypothesis and accept the alternative if T-statistics >Critical-value and conclude that then the relationship among the variables under the study is not by accident or spurious, but they have a theoretical relation.

Table 6: Engle Granger test using the 4 variables

95% simulated critical value using 38 observation			
ENGLE GRANGER CAUSALITY TEST			
EQUATION	T-STATISTICS	C- VALUE	DECISION
LDTAX INPT LIDTAX LNONTAX LSPENDING	-3.8045	-4.3977	NO COINTEGRATION
LDIDTAX INPT LDTAX LNONTAX LSPENDING	-2.9055	-4.3977	NO COINTEGRATION
LNONTAX INPT LIDTAX LDTAX LSPENDING	-2.558	-4.3977	NO COINTEGRATION
LSPENDING INPT LIDTAX LNONTAX LDTAX	-1.1592	-4.3977	NO COINTEGRATION

In the table above, we found out that the t-statistics for the total four equations are lower than the critical value. Therefore Engle-Granger concludes that there is no cointegration or long-term relationship among the variables and all the variables are exogenous.

Table 7: Engle Granger test (ADF test for residuals)

ENGLE GRANGER				
ADF tests for variable RESID				
Test Statistic	CV	AIC	SBC	HQC
-3.7512	-3.5313	37.2698	33.9946	36.1045

Similarly we have tested if the residual was stationary. If the difference between the variables is narrowing then the residual will be stationary and that will indicate cointegration. Assuming the null hypothesis is that the residual is non-stationary and the alternative to be stationary, we found out in the table above at 95 % confidence level the T-statistic of the residual is greater than the Critical Value. Therefore, we reject the null hypothesis and accept that the residual or error-term is non-stationary. This conclusion shows that the differences between the variables are not narrowing down and therefore there is no long-term correlation.

Johansen Test

We found using Engle-Granger test that the there is no a long-term relationship between government spending and the different types of government revenue.

However, we have conducted another cointegration test called Johansen to strengthen and confirm the inexistence of a long-term relationship between the four variable sas portrayed by Engle –Granger. Using Johansen test to look for a potential cointegration we found out in the below table the variables under study are effectively cointegrated.

Table 8: Johansen test for cointegration

JOHANSEN TEST 42 Observations (1972 to 2013). Order of VAR = 2				
NULL HYPOTHESIS	ALTERNATIVE HYPOTHESIS	T-STATISTIC	95% C.V	90% C.V
MAXIMUM EIGENVALUE STATISTICS OF THE STOCHASTIC MATRIX				
r = 0	r = 1	41.3088	31.79	29.13
r<= 1	r = 2	14.5307	25.42	23.1
TRACE STATISTICS				
r = 0	r>= 1	69.9591	63	59.16
r<= 1	r>= 2	28.6503	42.34	39.34

Therefore, we can insure that at least one variable is endogenous, there is a theoretical relationship among the variables and they are in equilibrium in the long run. Although each variable may contain some information for the prediction of other variables, co-integration test does not reveal any information on direction of causality or in other words the test doesn't reveal which variable is exogenous and which one is endogenous.

Table 9: Summary of the number of cointegrating vectors

COINTEGRATION		
TEST	DECISION	NUMBER OF
ENGLE-GRANGER	NO COINTEGRATION	0
EIGEN-VALUE	COINTEGRATED	1
TRACE	COINTEGRATED	1
AIC	COINTEGRATED	4
SBC	COINTEGRATED	1
HQC	COINTEGRATED	1

According to the table above other than Engle-Granger test, all the others indicate the existence of a cointegration factor, proving the existence of long-term relationship and this is accepted at 95% confidence level. The null hypothesis that indicates

cointegration is rejected at 5% significance level and the alternative hypothesis that informs that the relationship is not spurious is accepted.

Long Run Structural Modeling (LRSM)

Cointegration doesn't inform about the direction of Granger-causation as to which variable is leading and which variable is lagging (which variable is exogenous and which one is endogenous or follower). Therefore, long run structural model solves this issue. This step quantifies the relationship between the variables, when one variable is taken as dependent variable. These results or the actual coefficient values can be compared with a priori (theoretical) expectation of the researchers. Besides, the significance or the insignificance of the variables can be tested and found.

The main objective of this paper is to find out if the different types of Government Revenue Indirect Tax (IDTAX), Direct Tax (DTAX) and Non-Tax Revenue (NONTAX) have an impact or causes the Government Spending (SPENDING).

Table 10: Exact and over-identifying restrictions on the cointegrating vector

42 observations from 1972 to 2013. Order of VAR = 2.					
* - 5% LEVEL OF SIGNIFICANCE OR 95% CONFIDENCE LEVEL					
VARIABLE	PANEL A	PANEL B	PANEL C	PANEL D	PANEL D
LDTAX	-0.90428*	0.00000	0.36875	-1.39580	1.49690
	(0.087343)	(*NONE*)	(1.0588)	(.40788)	(4.4186)
LIDTAX	0.58525*	0.38288	0.00000	0.92408	0.00000
	(0.083101)	(0.42845)	(*NONE*)	.36297)	*NONE*)
LNONTAX	-0.42588*	-0.52782	-0.40426	0.00000	0.00000
	(0.42588)	(0.34032)	(0.42664)	(*NONE*)	*NONE*)
LSPENDING	1.00000	1.00000	1.00000	1.00000	1.00000
	(*NONE*)	(*NONE*)	*NONE*)	(*NONE*)	(*NONE*)
TREND	0.00899	-0.05782	-0.08335	-0.00722	-0.23482
		(0.034788)	(0.094387)	(0.024655)	(.43108)
CHI-SQUARE		24.64130	26.21150	21.46900	26.66710
	NONE	[.000]	[.000]	[.000]	[.000]
LOG-LIKELIHOOD	163.770	151.450	150.665	153.036	153.036

Hence, we imposed a normalizing restriction of unity on the Government Spending (SPENDING) at the "exactly identification" Panel A indicates the exact-identification of the variables and all the variables are found to be significant at 5% significance level and this is can be found by dividing the variable coefficient by the standard error. All the variables T-statistics where greater than 2 indicating they were significant. This can be seen in the below table.

Table 11: Test of coefficient significance

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO	IMPLICATION
LDTAX	-0.90428	-0.087343	10.35	*VARIABLE IS SIGNIFICANT*
LIDTAX	0.58525	0.083101	7.04	*VARIABLE IS SIGNIFICANT*
LNONTAX	-0.42588	0.045865	-9.29	*VARIABLE IS SIGNIFICANT*
LSPENDING	1	NONE	-	-
TREND	0.0089867	0.0089867	1.00	*VARIABLE IS INSIGNIFICANT*

We expected that an increase in government revenues would increase government spending. Therefore deriving an expectation of positive relationship between government spending and all the different types of government revenues. However, The results shows that while Direct and Non-Tax revenues are negatively related to Government Spending, the indirect tax revenues is positively related to Government Spending. This indicates that a 1% increase in Direct Tax is estimated to decrease Government spending by 0.9%, stimulating the economy toward a balanced budget, similarly an increase in Non-tax revenue is expected to decrease the overall government spending by 0.43%. On the other hand, an increase in Indirect Tax increase by 1% is estimated to increase Government Spending by 0.58%, hence increase in Indirect tax may not stimulate the economy toward a balanced Budget. Since majority of the related researches focused on the causality relationship between government revenue and spending, a proper explanation couldn't be derived.

Therefore, we could only humbly attempt to give reasoning to this relationship. We believe that perhaps the positive relationship between indirect tax and government spending might be that since this type of tax is majorly from sales and service tax, it is applied on every buyer and seller (rich and poor), therefore reducing the purchasing power of the poor and this will be reflected through an increase in government

spending since government must subsidize this part of society. However, this may not be the case because there is lag of time. In other words, the impact of one tax structure may not impact government spending the same year. Besides, differential in term of huge tax and revenue collection cost process and insuring the elimination of tax avoidance and tax evasion might lead this outcome.

Table 12: significance of variables after over-identification

VARIABLE	CHI-SQ (P-VALUE)	IMPLICATION
LDTAX	[.000]	VARIABLE IS SIGNIFICANT
LIDTAX	[.000]	VARIABLE IS SIGNIFICANT
LNONTAX	[.000]	VARIABLE IS SIGNIFICANT
LSPENDING	-	-
TREND	-	-

We decided to further test the significance of the coefficients found in the table, by applying the estimates with an over-identification restriction test. In order, to confirm that all the variables that are said to be significant are really significant, we have equalized each variable with zero to check the outcome. The null hypothesis assumes that the restriction is correct, while the alternative assumes the opposite.

Panel B, C, D, are just used to investigate a restriction of zero on the Direct tax, Indirect Tax and Non-Tax Revenue, respectively. The results are all significant and below 5%, the results, therefore indicating to reject the null hypothesis and accept the alternative. We also made a restriction for all the variables at the same time (DTAX=IDTAX=NONTAX=0) and found that the restrictions don't stand. In sum, the coefficients are all significant and the results confirmed our earlier findings. Therefore we proceed with our initial findings to proceed with our tests

We also derived the ECM equation:

$$ECM1 = -.90428*LDTAX + .58525*LIDTAX - .42588*LNONTAX + 1.0000*LSPENDING + .0089867*Trend$$

(0.087343)   0.083101   -0.42588   (*NONE*)   -0.0062

Vector Error Correction Model (VECM)

Since cointegration does not provide clarification on the Granger causality in terms of which variable is lagging and which variable is leading (i.e., endogenous or exogenous), we used Vector Error Correction model technique to unveil this matter. By looking at the significance of the error correction term (residual) we have concluded which variable is endogenous and which one is exogenous. We found out that Government Spending and Direct Tax revenues are endogenous or followers, since their P-value is lower than 5%. Therefore these variables respond to changes in Non-Tax revenues (0.81) and Indirect Taxes (0.469). The significance of error term indicates the endogeneity and the state of being a follower. The information derived from this test will enable the policymakers to take proper decision, when having certain objective. The policymakers will be able to predict future changes in the economy or implement certain strategy to improve the economy if they know which variable to shock in order to attain certain objectives. The exogenous variables will be the interest of the policymakers to manipulate the overall budget of the country and move it to a certain direction.

The coefficient of ECM(-1) indicates the time it will take to get back to long-term equilibrium if the variable is shocked, it represents the proportion of imbalance corrected in each period. For example, the coefficient of ECM (-1) for Direct Tax Revenue is 0.67 this indicates that when there is a shock on that variable, it would take on average 6.7 years for the variable to get back to equilibrium with the other variables.

Table 13: Error Correction models

42 observations from 1972 to 2013. Order of VAR = 2.				
* - 5% LEVEL OF SIGNIFICANCE OR 95% CONFIDENCE LEVEL				
VARIABLE	DDTAX	DIDTAX	DNONTAX	DSPENDING
DDTAX(-1)	0.085106	-0.17117	-0.088639	-0.09504
	(0.16366)	(0.2293)	(0.24675)	(0.11666)
DIDTAX(-1)	0.24874	0.18354	-0.038617	0.36694
	(0.18119)	(0.25387)	(0.27318)	(0.12915)
DNONTAX(-1)	0.10615	-0.089844	-0.38117	-0.10134
	(0.12819)	(0.1796)	(0.19327)	(0.091374)
DSPENDING(-1)	-0.17335	0.12887	0.42473	0.1743
	(0.29749)	(0.41682)	(0.44853)	(0.21206)
ECM(-1)	0.67028*	-0.27765	0.098932	-0.39542*
	(0.27095)	(0.37963)	(0.40851)	(0.19314)
SERIAL CORRELATION	2.5986[.107]	.1574E-5[.999]	.55338[.457]	.27805[.598]
FUNCTIONAL FORM	.83337[.361]	.28460[.594]	.71404[.398]	.88101[.348]
NORMALITY CHSQ(2)	.027145[.987]	10.7690[.005]	.30324[.859]	2.3167[.314]
HETEROSKEDASTICITY	.60834[.435]	.45413[.500]	1.6204[.203]	3.6569[.056]

We found out that government spending and direct taxes are followers, since the P-values of the error term ECM (-1) are lower than 5%, however Indirect taxes and Non-revenue Taxes are found to be exogenous because they have a higher value of 5% p-value. Moreover, the results indicates that diagnostics of all equation of error correction method (testing for the presence of autocorrelation, functional form, normality and (heteroskedasticity) may suggest that the equations are well specified.

Table 14: Summary of exogeneity and endogeneity of variables

P-VALUE > 5% EXOGENEOUS , P-VALUE < 5% ENDOGENEOUS				
VARIABLE	ECM (-1) P-VALUE	T-RATIO	IMPLICATION	DECISION
LDTAX	[.018]*	2.4738	ENDOGENEOUS	SIGNIFICANT
LIDTAX	[.469]	-0.73136	EXOGENEOUS	INSIGNIFICANT
LNONTAX	[.810]	0.24218	EXOGENEOUS	INSIGNIFICANT
LSPENDING	[.048]*	-2.0474	ENDOGENEOUS	SIGNIFICANT

Exogenous variable indicates that the variable is influenced by external factors and its own lags (past trend) rather than the influence of the other variables under study. Any shock inflicted on Non-tax revenues and Indirect Taxes will influence the behavior of Government spending and Direct Tax Revenues in a certain direction or toward equilibrium. In other words, government spending and direct tax responds to the

changes in Indirect taxes and non-tax revenues. Since these are mostly explained by their own past trend and relatively depend less on the variables under study.

Variance Decomposition Analysis (VDC)

The variable Indirect Taxes and Nontax revenues receives exogenous shocks resulting in deviation from equilibrium and transmits to other variables. Nevertheless, Direct taxes and Government Spending bears the brunt of short-run adjustment to bring about long equilibrium. However, the information given by the Vector error Correction Model might no be enough, since there is no information on relative exogeneity or endogeneity of the variables. Variance decompositions exhibit the contribution of each source of innovation to the variance of the k-year ahead forecast error for each of the variables. Stated otherwise, variance decompositions refer to a breakdown of the change in the value of the variable in a given year arising from changes in the same variable as well as other variables in previous years.

The vector error decomposition technique has two types the orthogonalised and the generalized. However, in this paper we will just consider the generalized form of VDC and disregard the orthogonalised. The reason is that orthogonalised method is known to have shortcomings and is more biased toward the first variable, since they are not unique and generally depend on the particular ordering of the variables and also assumes that when a particular variable is shocked, all other variables are switch off. On the other hand, generalized VDCs are invariant to the variables ordering and other variables in the model are not switched off when a particular variable is shocked.

Generalized

We rely on Generalized VDC in ranking the variables on the basis of most exogenous to most endogenous. The total summation of the outcome for each horizon is more than 100%. Therefore, the tables needed to be normalized and coefficients to be adjusted. We have made the proper adjustments so that the sum will be equal to 100%. The following forecasted years would enable us to rank the variables.

Table 15: Percentage of forecast variance explained by their own lag: in Generalized Variance Decomposition

YEARS	CHNG DTAX	CHNGIDTA	CHNGNONTAX	CHNGSPENDING
RELATIVE VARIANCE IN CHANGE DTAX				
1	45.586%	36.459%	1.033%	16.922%
3	40.76%	43.23%	1.54%	14.47%
5	40.53%	43.77%	1.49%	14.21%
RELATIVE VARIANCE IN CHANGE IDTAX				
1	21.83%	72.66%	1.65%	3.86%
3	23.19%	71.63%	1.36%	3.82%
5	23.40%	71.49%	1.32%	3.78%
RELATIVE VARIANCE IN CHANGE NONTAX				
1	0.10%	1.26%	73.30%	25.33%
3	0.21%	0.98%	71.90%	26.92%
5	0.22%	0.90%	71.39%	27.48%
RELATIVE VARIANCE IN CHANGE SPENDING				
1	29.04%	9.93%	11.49%	49.53%
3	31.71%	9.22%	11.81%	47.26%
5	32.38%	9.38%	11.60%	46.64%

We found out that there is a general agreement that the government spending and direct taxes are followers and highly depends on the change of government revenues and tax structure, since the proportion of the variable explained by its own path can determine the relative endogeneity and exogeneity of the variable.

However, the relative exogeneity between non-tax and indirect tax is quiet close. The results show that the proportion of changes explained by its own lags in non-tax and indirect tax revenue is almost identical for the 3 horizon forecasted years. While, Non-tax revenue leads the forecasted 1 and 3 years, the Indirect tax revenue lead in the forecasted third year. However, this is not in accordance with VECM since the results found was that non-tax revenue was leader by far and had coefficient of (0.81) while indirect tax revenue only had (0.47).

We can notice in the table below that while Government spending and direct taxes are explained by their own path by only 49.5% and 45.5%, respectively. The non-tax revenue and indirect taxes are explained by their own lags by (73) and (72.66) respectively in the forecasted horizon number 1. Similarly, for the forecasted horizon number 3, the results shows that the variable that mostly explained by its own lag is Non-tax revenue (71.9), which is not that significantly different from the proportion of indirect tax that is explained by its own variation (71.63). However, there is no doubt that direct taxes is most endogenous (40.8) and is followed by spending with a value of (47.2).

To conclude, spending and direct taxes are sensitive to changes in non-tax revenues and indirect taxes. The results indicates that there is a possibility of a balance government budget since LRSM showed the negative relationship between direct taxes and nonrevenue taxes, which can be a phenomena if results are not misleading and this could be explained by efficiently collecting those revenues (Direct tax and Non-tax revenues). Besides, the results indicates that policy makers can manipulate the government spending which is the object of our focus in this study using a regressive indirect tax revenues and non-tax revenues, in order to achieve an optimum balance.

Impulse Response Function

The impulse response just portrays the graphical expositions of the shock of a variable on all other variables in two main form orthogonalised and generalized impulse response. In this case we will just investigate the impact of the followers when the exogenous variables are shocked (non-tax revenues and indirect tax revenues). The results in this section are similar to VECM results. We have just shown the generalized form, since we believe that orthogonalised results tend to be biased toward the first variable.

The results shown refer to the impact on the variables when exogenous variables are shocked.
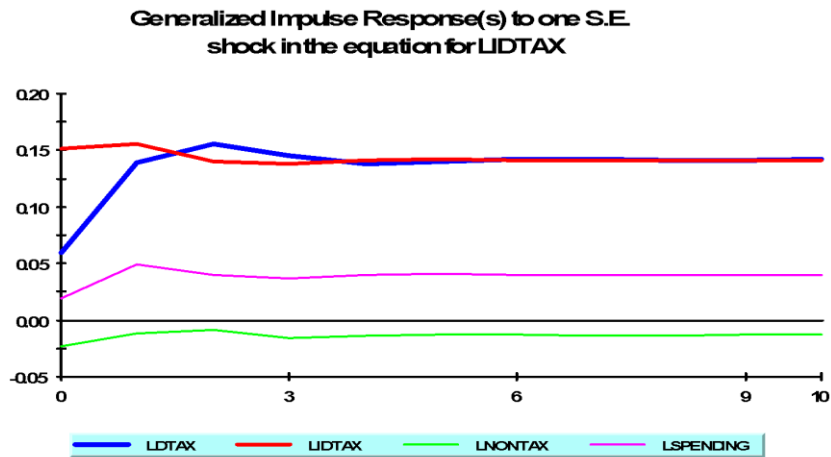
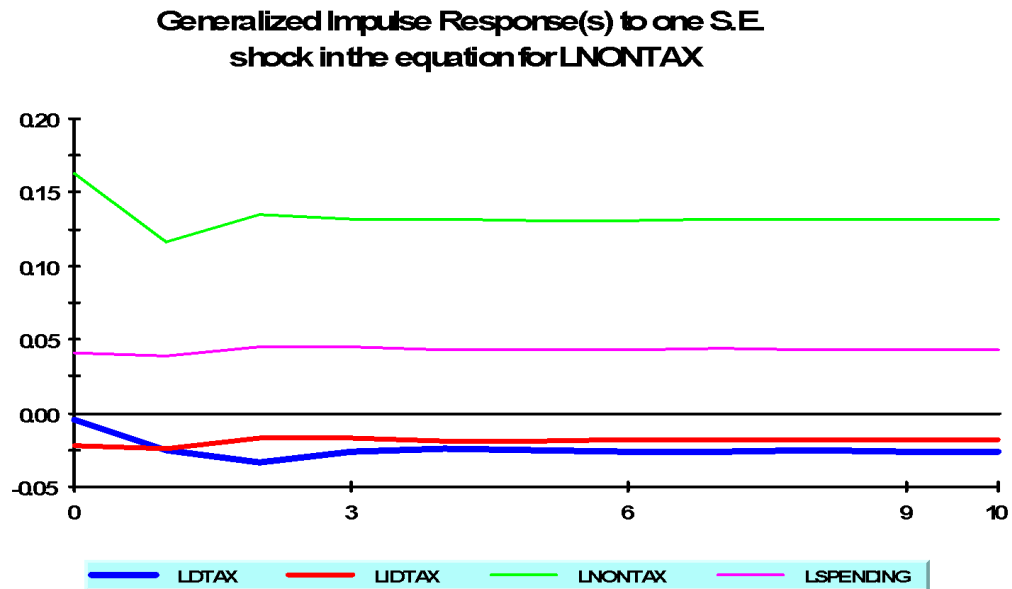Figure 1: Generalized Impulse response after Indirect tax revenue shock

Figure 2: Generalized Impulse response after Non-tax revenue tax shock

The first figure refers to the impact of shocking Indirect tax on other variables. While the second figure shows the impact on all the variables when Non-tax revenue variable is shocked.

Persistence Profile

Similar to the Impulse Response Functions (IRFS), the Persistence Profile also graphs the dynamic response path of the long run relations. It maps the impact of an external

shock on the variables under study and how long it will take the system to get back to equilibrium. In this figure we can estimate that it will take almost 4.5 years to turn to the origin.
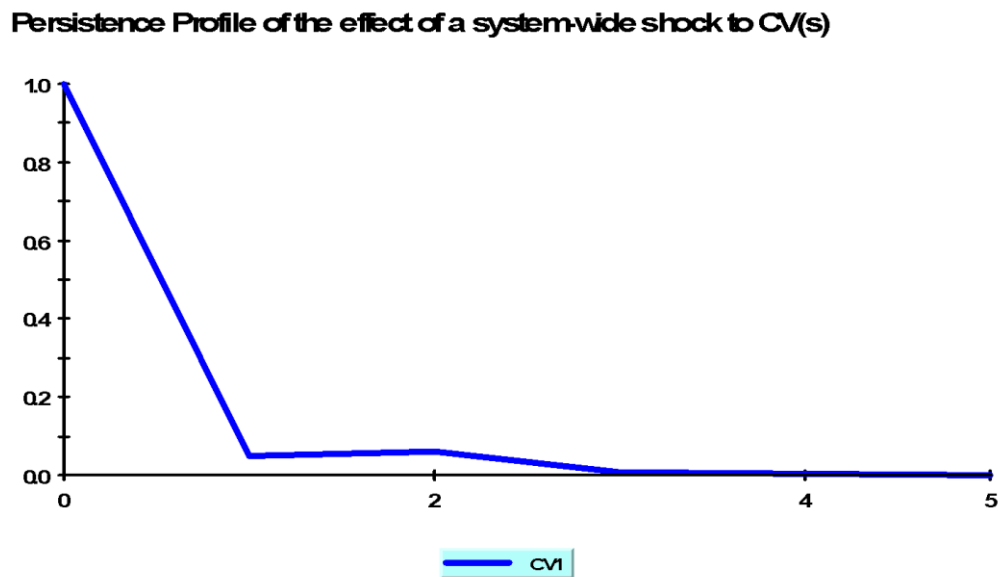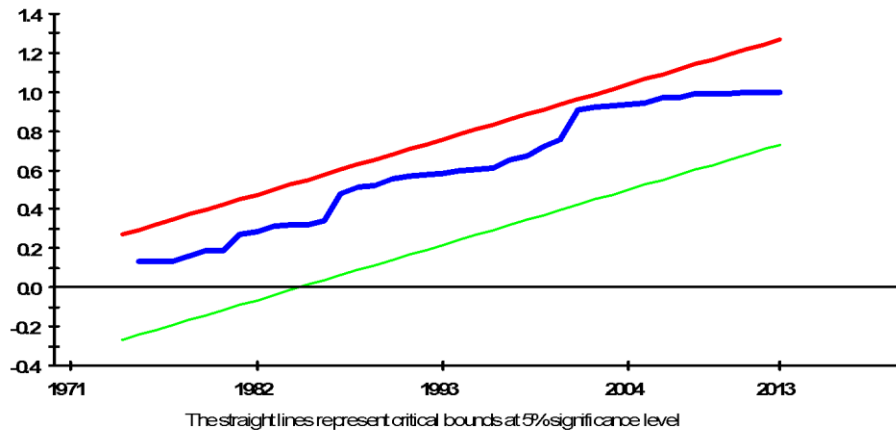

Figure 3: Persistence Profile of external shock

CUSUM and CUSUM SQUARES

We also tested for CUSUM and CUSUM SQUARE to show the stability of the coefficients, the figures indicate that the coefficient were stable and didn't change over time, since they didn't cross the critical bounds.
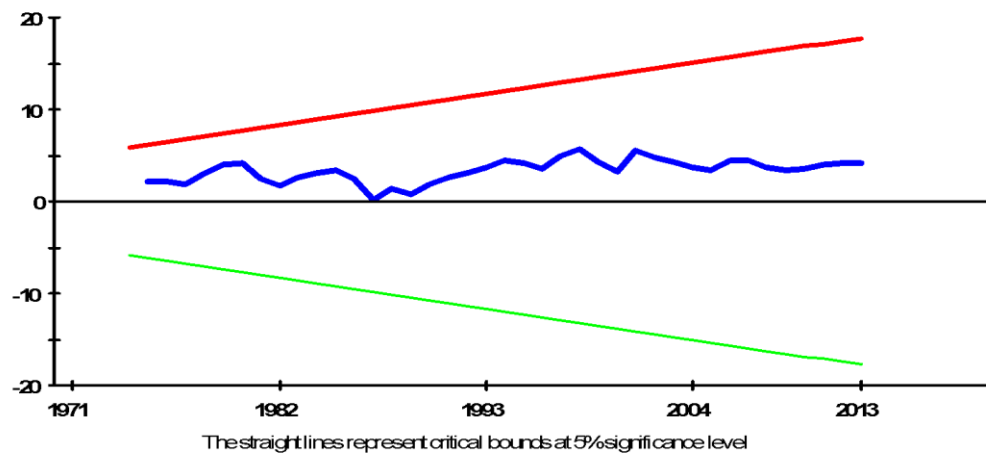
Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

(a)

(b)

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of cumulative sum of recursive Residuals and (b) plot of cumulative sum of squares of recursive residual

Conclusions and Policy Implications

The main aim of this study was to humbly attempt to find out the relationship between the different types of government revenues and government spending and the existence of a possible theoretical relationship between the four variables. It is

undeniable that taxation is a crucial element in any country's sustainability, growth and development. In Islam the optimum tax structure is considered direct taxes, due to their inherent characteristics of being proportional and imposed on the net profit or income. However, strategies of influencing direct taxes to equilibrate the government budget may not be visible in a modern Islamic country such as Malaysia due to change in economic structure and globalization effect. The development of an Islamic state such as, Malaysia depends on the well management of government budget and requires it to be balanced.

Fiscal policy to achieve this balance might be reduction of government spending such as reduction of government subsidy, spending on defense and public sector enterprises will minimize government spending. However, an efficient tax structure can also enhance growth and budget stability. In our analysis, we found out that increase in indirect taxes may not help to reduce budget deficit, since there is a positive relationship between government spending and the tax structure. The reason might be that an indirect tax is applied on goods and services regardless of the poor and rich, therefore this may reduce the future income of the poor and Malaysian government will have to subsidize the shortage, therefore increasing government spending through subsidize.

Besides, increase in tariff and taxes on import duties may discourage foreign investment, therefore forcing government to undertake such investment and increasing government spending. These reasons might be a proper explanation of the positive relationship between government spending and indirect taxes. Additionally, an increase in direct taxes may not be also applicable. Although, there is a negative relationship between direct taxes and spending and this may lead to a balance budget. However, we bear in mind that we found that the variable was endogenous (follower). Therefore, a shock on direct taxes may not influence spending toward equilibrium and benefit the policy makers. Moreover, it is generally agreed that tax revenue highly depends on tax rate and tax base; therefore if the tax base is narrow the tax rate is expected to be high. The narrower the tax base, the higher will be the tax rate to generated certain expected revenue that could be used to cover government spending. Nevertheless, this may lead to inefficiency since there is incentive for tax avoidance and evasion and may lead to economic distortion in addition of perhaps greater

reliance on indirect tax. Consequently, although direct tax collection might be quiet significant, it may not be enough to cover government spending. According to our findings, government spending can be managed through a regressive indirect taxes and increase in non-tax revenue. However, the descriptive analysis indicates the relative small portion collected of non-tax revenue may not be effective to the growth and development of Malaysia economy.

Therefore, we believe that tax reform of the entire tax system is indispensable, for example since a progressive tax rate may discourage tax payers, tax base should be increased though an increase in government investment in increasing capital goods productivity. Government should focus in stimulating employment, productivity, technology, human capital that will consequently increase profit of the companies and the bulk of taxable income and wages. Consequently, the bulk of tax revenue will increase without necessarily increase tax rate that discourage taxpayers and lead to inefficiency or tax avoidance and tax evasion. Then, the tax system might be enhanced so as the total revenue collected will cover government spending and encourage a balanced government budget.

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