Measuring the Impact of the Jamaican Government on the Economy via Fiscal Multipliers

Working Paper

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The recent global economic crisis and the subsequent contraction in Jamaica's economy have renewed attention and interest on the impact of expansionary fiscal policy on economic activity, that is, Jamaica's fiscal multiplier. This paper seeks to shed some light on this issue by determining the dynamic effect of expansionary fiscal policy on economic activities in Jamaica, using quarterly data from 1993 Q2 to 2012Q2. The paper employs the traditional Structural Autoregressive Model (SVAR)-pioneered byBlanchard et al (2002), due to its ability to capture the dynamic responses of fiscal policy shocks and determining fiscal multipliers. The results of the model indicate that the effect of expansionary fiscal policy in Jamaica on GDP is weak and not persistent. Specifically, the fiscal multiplier was found to be very small on impact and zero over the long run. It was also found that the impact multiplier for consolidated capital expenditure was larger than government spending multiplier while there is no difference in the long run multiplier.

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[*]The views expressed in this paper are not necessarily those of the Bank of Jamaica.

Introduction

The recent global economic crisis and the subsequent contraction of the Jamaica economy have brought renewed attention and debate to the question of whether the government should increase spending to combat the effects of the recession or should they consolidatefiscal spending in order to reduce the fiscal deficit and therefore set the economy on a sustainable path. Those arguing for an increase in government spending tend to do so from a textbook Keynesian position which states that output is determined by aggregate demand, thus the multiplier effect of fiscal expansion would increase aggregate demand and ultimately output. In other words, an increase in government spending or a reduction in taxes will have an expansionary effect on economic growth. On the other hand, the argumentsagainst expansionary fiscal policyhas been for small open economies and highly indebted countries like Jamaica, increases in government spending only increase the debt, crowd out private investment and widen the fiscal deficit. Moreover, it has been suggested by the critics, that fiscal stimulus measures are not likely to be well targeted, but are likely instead to be directed toward wasteful and distortionary public resources. Further, once implemented they are not likely to be withdrawn sufficiently to preserve fiscal sustainability.

Empirical studies on the fiscal multiplier have offered no consensus on sign, size or even the persistence of fiscal multipliers. Blanchard et al (2002) and Skeete (2011) showed that expansionary fiscal policies tended to have a positive effect on output. Mendoza et al (2010) indicated that while the fiscal multiplier tended to be positive and large for some countries, countries with a high debt to GDP ratio tend to have small or negative multiplier. Other studies have shown that expansionary fiscal policy tends to have little or no effect on output.

Few studies have been done on Jamaica and the Caribbean. Guy et al (2009) and Bynoeet al (2008) employed SVAR to address the effectiveness of fiscal policy in Barbados. In addition, Skeete (2011) also employed SVAR to address the effectiveness of fiscal policy in the Caribbean in particular Jamaica, Barbados and Trinidad & Tobago, however, Guy et al (2009) and Bynoeet al (2008) only considered the case of Barbados in their studies. On the other hand, Skeete (2011) did not provide an in-depth analysis of the role of fiscal policy in influencing economic activities in Jamaica andmoreover failed to consider the influence of fiscal policy on investment,

consumption and central bank policy interest rate. In addition, Skeete (2011) did not explore whether the type of government spending had any greater effect on economic activities in Jamaica. Annual data used in this study increases the risk of simultaneity bias.

This paper aims to identify Jamaica's fiscal multiplier and provide evidence of the crowding-out effect on economic activities of an increase in government spending. It seeks to identify the strength and persistence of expansionary fiscal policy on output. In addition, the studies seek to determine if the types of government spending in Jamaica matter in determining the size of fiscal multipliers. Finally, the paper seeks to establish the influence of monetary authorities on the size of Jamaica's fiscal multiplier.

Literature Review

There are generally three approaches used to study fiscal multipliers, the narrative approach, the structural model approach and the structural VAR approach. The *narrative* approach, pioneered by Ramey et al (1998) involves isolating the exogenous unanticipated component of fiscal policy changes and estimating reduced-form regressions of GDP on dummy variables corresponding to episodes of exogenous fiscal policy changes. Evidence from such event studies is consistent with some effectiveness of fiscal policy. For instance, Guimarães(2010) found that the 2001 income tax rebates in the United States were effective in boosting consumption, but the multiplier was estimated at less than one.

The second approach is based on full-fledged structural models. The class of models used, range from the more traditional simultaneous equations models such as the one used by Macroeconomic Advisers to fully-optimizing DSGE models with price rigidities as in Taylor et.al. (2009). Researchers who used these types of models found that the size of estimated multipliers is not robust, as evident inGuimarães (2010). The third approach pioneered by Blanchard et al (2002), identified fiscal policy "shocks" using VARs and simulated the dynamic impact of these shocks on GDP and other variables of interest. Guimarães (2010) further stated that identification of the fiscal shocks is typically achieved by assuming that government spending is predetermined within a quarter (such assumption would not be reasonable with annual data). The VAR studies typically found a larger effect of government spending on GDP

and in some cases they found government spending actual crowds in consumption (e.g. Blanchard et al, 2002).

Traditional Mundell-Fleming analysis and several empirical studies have emphasized that the effectiveness of fiscal policy hinges on several factors including trade openness, financial innovation, monetary policy framework, the health of public finances, the nature of fiscal policy changes and the exchange rate regime employed by a country. Scottet al (2008), Giancarlo et al (2010) and Mendoza et al (2010) argue that the health of public finances/level of public indebtedness is an important factor in determining the output effect of fiscal expansion. Scottet al (2008)argues that high debt level lowers the multiplier because fiscal expansions are associated with rising interest rates and spreads. Hefurther contended that while interest rates on government bonds may not respond to bad news about the fiscal position, credit spreads may do the job, raising the cost of financing for corporations and households. This point was emphasized by Agcaet al (2009), when they found that public external debt has a sizable positive impact on corporate syndicated loan spreads.

Further, Mendoza et al (2010) argued that when debt levels are high, increases in government expenditure may act as a signal that fiscal tightening will be required in the near future. The anticipation of such adjustments (in effect, a contraction in fiscal policy, possibly involving both a reduction in fiscal spending and higher taxes) should have a contractionary effect that would tend to offset whatever short-term expansionary impact government consumption may have. Under these conditions, fiscal stimulus may therefore be counter-productive (Mendoza et al, 2010).Several empirical studies seem to support this claim. Mendoza et al (2010) in a cross sectional study, found that the impact multiplier for highly indebted nations was close to zero and the long run impact was negative. Similarly, Scott et al, (2008), found that multipliers for high-debt economies weresmall and persistently negative.

According to Guimarães (2010), fiscal policy remains effective when monetary policy isaccommodative, thus alleviating the crowding-out effect (Scott et al, 2008). This point is emphasized by Christiano et al (2009), Scott et al (2008),Mendoza et al (2010) and Erceget al (2010). They found that fiscal multiplier is large (greater than one for government spending)

when the nominal interest/central bank policy interest rate is constant. Schindler et al (2009)[1] argued that accommodative monetary conditions can increase the size of multipliers by a factor of 2 to 3.

According to Corsetti et al(2010) another determinant of effective fiscal policy is the state of the financial system, or more specifically, the extent to which the private sector has access to credit, given the greater impact of fiscal stimulus in the presence of liquidity constraints. This point is supported by Scott et al (2008) who indicated that financial development yields a higher multiplier.

In addition to the factors mentioned above, several studies which include Mendoza et al (2010) and the traditional Mundell-Fleming model have argued that trade openness plays a critical role in determining the effectiveness of fiscal multipliers. They argued that the fiscal multiplier would be lower in a more open economy (i.e., an economy with a higher marginal propensity to import) because part of the increase in aggregate demand would be met by a reduction in net exports rather than by an increase in domestic production. This point was exemplified by Mendoza et al (2010) who found that for open economies their fiscal multipliers were negative while for closed economies, their multiplier were positive and large. However, Scott et al, (2008)found that higher levels of trade openness yield higher multipliers.

From a rational expectations view point, the distinction between temporary and permanent policy changes is an important determinant of the effectiveness of fiscal policy as this would significantly alter adaptive expectations. For example, while a temporary fiscal expansion that has no long-term effects will not influence expectations; a permanent fiscal expansion can lead to crowding out –possibly to an extent that fiscal multipliers turn negative. Hemming et al., 2002 explains that this is due to the fact that households and firms will expect that an initial increase in interest rates and appreciation of the exchange rate will persist and could become larger. The Ricardian principle is that the outcome of a fiscal expansion is dependent on how consumers perceive the increased spending would be paid for in the future. Consumers are forward-looking and are fully aware of government's inter-temporal budget constraints. Therefore, an increase in

[1] IMF Staff Position Note (May 2009)

government spending may have no effect on aggregate demand (or possibly negative fiscal multipliers), as consumers tend to offset fiscal injections through higher private savings –so that aggregate demand is not affected.

Finally, another important determinant of effective fiscal multiplier is the exchange rate regime employed by a country. Mendoza et al (2010) argued that under a flexible exchange regime, an initial effect of a fiscal expansion is to increase output, raise interest rates, and induce an inflow of foreign capital, which creates pressure to appreciate the domestic currency. Under predetermined exchange rates, the monetary authority expands the money supply to prevent this appreciation. Mendoza et al (2010) found that countries operating a predetermined exchange rate regime had an impact multiplier of 0.09 and a long run multiplier of 1.5 while economies operating under flexible exchange rates had an impact multiplier of -0.28 and a long run multiplier of -0.41. However, Scott et al (2008) contends that multipliers are higher under a flexible exchange rate regime.

Studies byMendoza et al (2010) and Sharmda et al (2010) indicated that the effect of fiscal policy on output and the size of fiscal multipliers varied considerably for different countries. While employing a Structural Vector Auto regression (VAR) model, Mendoza et al (2010) found that a fiscal multiplier/output effect of an increase in government consumption was larger in industrial than in developing countries. They also found that investment responds negatively to a shock to government consumption, while private consumption responds positively to a shock to government consumption when operating under a fixed exchange regime and negatively under a flexible exchange regime. Of note, they found that once monetary policy is controlled for, consumption responds positively to government consumption shocks, but only when the central bank accommodates the fiscal shock. Sharmda et al (2010), while studying the impact of fiscal policy shocks on the Indian economy, found that the tax and government spending impact multipliers were -1.37 and 0.09, respectively, while the long run tax and government spending multiplier was -1.89 and 1.38, respectively. Guimarães (2010) who also studied India,found that tax revenue multiplierwas almost twice as large as the current spending multiplier. Of note, Guimarães (2010) found that the developmentspending multiplier was greater than 1, suggesting that the composition of spending matters. Similarly, the Scott et al (2008) also found that tax and

spending multipliers were generally in line with economic theory but they were relatively small. In addition, revenue-based stimulus measures were found to be more effective in boosting real GDP than expenditure-based measures, particularly in the medium-term and for advanced economies. Their study also indicated that expenditure-based impulses had consistent negative effects in emerging economies in the medium-term; perhaps reflecting concerns that, once implemented, increased expenditure was difficult to remove.

Blanchard et al (2002), pioneers in their use of a Structural Autoregressive model to study fiscal multipliers, found that positive government spending shocks have a positive effect on output, and positive tax shocks have a negative effect on output. Of note, they found that both increases in taxes and government spending have strong negative effects on investment spending. Notwithstanding this however, they also found that private consumption responds positively to an increase in government consumption. However, Ramey (2009) countered this claim, when he found that private consumption declined in response to military expenditure shocks.

Ducanes et al (2006) in their study of the Macroeconomic Effect of Fiscal Policies in Bangladesh, China, Indonesia & the Philippines, found that short-term fiscal multipliers from an untargeted increase in government expenditure are positive but much less than those from an increased expenditure targeted at capital spending. They also stated that the multiplier effects from fiscal expansion via a tax rate reduction were typically much less than through higher spending. Of importance, they found that the short-run positive impact of higher fiscal spending, whether targeted or not, occurred mainly through investment on the demand side and secondary sector output on the supply side. On the other hand, Ducanes et al, 2006 stated that a tax reduction affects output primarily through private consumption and tertiary sector output

Crosetti et al (2010) in their panel study of several OECD countries found that a persistent increase in government spending increases aggregate output. Similar to the results of Blanchard et al (2002), they identified that government spending reduces investment while it increases consumption and that once there is a financial crisis, consumption and output rise about twice as much as the rise in spending.

In a Caribbean context, the results from a few studies indicate that fiscal multipliers are not very large. Skeete (2011) studied the effectiveness of fiscal policy in three Caribbean countries- Jamaica, Barbados and Trinidad & Tobago and found that government spending policies stimulated the economies of Jamaica and Trinidad & Tobago but not of Barbados. However, the multipliers in the case of Jamaica and Trinidad & Tobago were small and were found not to be persistent. Similarly, Bynoeet al (2008) indicated that there was a positive, but weak response of government expenditure shocks on real output in Barbados. However, the length of persistence in most cases was found to be small. In addition, Guy et al (2009) found that government expenditure shocks have a positive impact on real output in Barbados. Further, their study indicated that the response of private consumption and private investment in Barbados is quite similar to that of GDP, increasing in the short-term following the shock to government spending and declining in the longer term, indicating that that these effects were not persistent.

Methodology

The reduced-form VAR can be represented as[2]:

$$Y_t = C(L)Y_{t-1} + e_t \quad (1)$$

where $Y_t$is a vector of endogenous variables (consistof G_t, T_t, GDP_t, V_t,I_t,PI_t and PC_t)[3], C (L) is an autoregressive lag polynomial in the lag operator L, and $e_t$is a vector of reduced-form innovations, which are independent and identically distributed. The relation between the reduced-form innovations,e_t, and the objects of ultimate interest, the structural shocks, u_t, can be represented as:

$$Ae_t = Bu_t \quad (2)$$

where A and B are square matrices that respectively describe (i) the instantaneous relation between the variables and (ii) the linear relationship between the reduced-form innovations. The

[2] The structural specification followed the methodology adopted in McDonald et al, 2010 and Guy et al 2009.
[3] We also included 4 Dummy variables (as a Exogenous variables) that control for (1) structural breaks for 1994 to 1998 and 2008 to 2009, and outliers.

structural shocks are assumed to be independently and identically distributed with covariance matrix equal to the identity. The structural form of the VAR can be obtained by multiplying equation (1) by A and then applying the relational defined of equation (2):

$$AY_t = AC(L)Y_{t-1} + Ae_t = AC(L)Y_{t-1} + Bu_t \quad (3)$$

Solving equations (3) for Y_t yields the structural specification:

$$Y_t = [1 - C(L)L]^{-1}A^{-1}Bu_t$$

Identification

The identification of the structural form from the estimated reduced model requires restrictions to be imposed on the A and B matrix. For appropriate identification of the model, the assumptions of Blanchard et al (2002)were adopted which assumesthat policy makers and legislatures require more than a quarter to learn about GDP and other macroeconomic variables shocks, decide what fiscal measures, if any, to take in response, pass these measures through the legislatures, and actually implement them. In this regard, the use of Choleski decomposition was employed, where the assumption of the lack of a contemporaneous relationship informs the order of the variables in the estimated model.

In this regard, the variables were entered into the estimated VAR as follows:G_t,T_t,GDP_t,V_t,I_t, PI_t and PC_t. This ordering implies that the level of taxes, GDP, debt, private investment and private consumption do not have a contemporaneous impact on government spending. It is also assumed that GDP, debt, private investment and private Consumptiondo not have contemporaneous impact on the level of taxes. However, both government spending and the level of taxes have a contemporaneous impact on GDP and the level of debt.

The impact multiplier which measures the ratio of the change in output to a change in the fiscal variables ($G_t$and T_t) at the time in which the impulse to G_t or T_t occur. The long run multipliers which measures the cumulative change in output per unit of additional $G_t$or T_t, from the time of the impulse to G_t or $T_t$to the reported horizon. More specifically, government spendingmultiplier

was computed by dividing impact effects from the impact response function (IRF) of the SVAR by the ratio of government spending to GDP.

$$\text{Impact Multiplier} = \frac{\Delta y_0}{\Delta g_0}$$

$$\text{Cumulative Multiplier} = \frac{\Sigma_{t=0}^{T} \Delta y_t}{\Sigma_{t=0}^{T} \Delta g_t}$$

Data

For the purposes of this paper, taxes or the level of taxesis defined as the ratio of Tax Revenue to Consumption (Haan et al 2001). Government spending (TG) is defined as Total government spending that includes amortization. It is a well-known fact in Jamaica that the bulk of government capital expenditure goes through various public entities and as such measuring central government capital expenditure might not reflect the true picture of development spending in Jamaica. In this regard, capital expenditure (consolidated) (CCE) is measured by Central Government capital expenditure plus Capital expenditure for the Public Entities. Output is measured by Real GDP (GDP). We also included Total Government Debt divided by nominal GDP (V) due to theoretical relationship between fiscal policy and debt sustainability and also the evidence found by Mendoza et al (2010) that the level of indebtedness of a country determines the effect of expansionary government spending on output. Similarly, the Central Bank (CB) policy interest rate (I) was also included to determine if the monetary authority was accommodative to fiscal expansionary policy in Jamaica. Private consumption (PC) and private investment (PI) were included to determine the crowding out effect of expansionary fiscal policy on these variables. We also included four Dummy variables that control (1) structural breaks for the period 1994 to 1998[4] and 2008 to 2009[5] and (2) outliers. All the variables were seasonally adjusted using the Census X-12 Method.

The data series consist of quarterly observations covering the period 1993 to 2012. The Data were collected from the Bank of Jamaica (BOJ)[6]. It must also be noted that quarterly data on

[4] In this period Jamaica suffer and financial sector meltdown

[5] In this period Jamaica were experiencing the effects of world economic crisis.

[6]BOJ collects some data from the Ministry of Finance and the Statistical Institute of Jamaica.

Private Consumption[7] and Private Investment[8] were not available and as such the quarterly data was interpolated. In addition, quarterly data on capital expenditure for Public Entities was not available and as such the data was interpolated.[9]Similarly, quarterly data[10] on domestic amortization and total government debt were not available for the period June 1993 to 1996 and June 1993 to December 1995, respectively.

Consistent with Mendoza et al (2010), quarterly data were usedto ensure validity of the identifying assumptions used in a Structural Vector Autoregression. SVAR analysis assumes that fiscal authorities require at least one period to respond to new economic data with discretionary policy. It may take as long as a quarter for the response of fiscal authorities to a shock to be transmitted thus using annual data would not allow exact identification of when the impact takes place.

The Augmented Dickey-Fuller Test for unit root revealed that all of the variables in the model were I(1). In addition, the Johansen cointegration test using the trace and eigenvalue tests did not indicate the presence of a cointegration vector. In this regard, a VAR model was estimated of an order of 1 lags as chosen by the Lag Criterion test which satisfied diagnostic test for normality and the absence of autocorrelation (see appendix for respective tables).

[7]This variable was interpolated in asoftware program called Benching using quarterly data on imports due to its high correlation with these two variables

[8]This variable was interpolated in asoftware program called Benching using quarterly data on capital goods imports and consumption tax due to its high correlation with these two variables

[9]This variable was interpolated in E-views, using the Quadratic-match sum method.

[10]These variables wereinterpolated in E-views, using the Quadratic-match sum method.

Empirical Resultsand Discussions

As shown in figure 1, the response of output to a shock from government spendingtended to be weak and not very persistent. In fact, after recording a positive shock on impact, the response of output to government spendingbecomes zero (statistically speaking) after about 7 quarters.The fluctuation between the second to the fifth quarter can be attributed to the lags in the response of output to the lags in government spending[11].

The corresponding government spending multiplier (GSM) was computed based on the impulse response depicted in Figure 1. More specifically, to get the impact multiplier the impact effect (see Figure 1) was divided by the ratio of government spending to GDP.

The impact GSMis 0.02, which means that an additional dollar in government spending will deliver 2 cents of additional output in the quarter in which it is implemented. Focusing on the impact multiplier may be misleading because government spending packages can only be implemented over time and hence there may be lags in output responses. To capture this, the cumulative GSM was also computed. As can be seen in Figure 4, cumulative GSM for Jamaica decreases after an initial value of 0.02 to a value of zero. In other words, in the long run an additional dollar of government spending completely crowds out all other components of GDP.

Similarly, private investment (PI) in response to a shock to government spendingresponds negatively in the first and third quarters suggesting that government spending may crowd out private investment. In addition, private consumption (PC)appears to react to a shock to government spending in the same way as private investment in that it reacts negatively in the first two quartersbefore falling to zero the fifth quarters. Based on this evidence, it appears government spending displays some crowding-out effecton the other components (PI and PC) of GDP at least in the first couple of quarters.

Similar to the response of output to government spending, the response of output to a shock to taxes was found to be weak and not very persistent. Figure 2 shows that the initial response of output to a shock to taxes was -0.002 per cent in the first quarter and the response becomes zero after about 4 quarter. The impact tax multiplier was found to -0.05, which effectively means that

[11]Government spending is usually implemented over several quarters.

one dollar decrease in taxes should deliver 5 cent of additional output in the quarter it is implemented. The cumulative tax multiplier is zero.

In comparing the effect of government spending and taxes on output in Jamaica, it may seem that the latter does have a greater impact on the output given its higher initial impact. However, as can be seen in Figure 2, a shock to taxes does have a positive initial effect on private investment unlike government spending. Moreover, given the small impact of these two variables on output which can be seen via their respective multipliers, it is difficult to say if any of the variables have a greater impact on output.

These results (low fiscal multiplier) was consistent with what was obtained by (1) Mendoza et al (2010) who found that government spending multipliers tend to be small and even negative in developing countries; and (2) Skeete (2011) who found that government spending multiplier in Jamaica was small and not persistent.

The result above also seems to be consistent with what was found in the past for countries with high debt[12]. Studies such as Mendoza et al (2010) and Scott et al(2008) have found that countries with high debt tend to have multipliers close to zero and persistently negative. Jamaica[13] is regarded as a country with a high level of debt given by its debt/GDP ratio of over 60 per cent over the past 24 years. Furthermore, over the period 1993 to 2012, Jamaica debt service payment has averaged about 54.3 per cent of total government spending. In this regard, as explained by Mendoza et al (2010), any increase in government spending may act as a signal that fiscal tightening (taxes increases and a reduction in government spending) will be required in the near future. Thus in anticipation of this, consumers and businesses may not spend or invest in the short to medium term given the possibilities that they will be required to compensate for these expenditures in the future. In addition, given the high level of debt, an increase in spending is more likely to be financed in the short term by loans and as a result this may increase interest rate and as consequence this may act a deterrent to increased investment and consumption. Further, an increase in government spending that is facilitated by borrowing, crowds out private investments because this reduces the amount of funds available for the private sector to

[12]High Debt is defined in this paper as any country with a Debt/GDP ratio of 60 per cent and over.
[13] For the period Fiscal year (FY) 1988/89 to FY 2011/12 Jamaica Debt/GDP ratio has average about 113 per cent and they have recorded a Debt/GDP ratio of over 60 per cent in every single FY since FY 1988/89 –Present.

borrow.Thus, due to high level of debt that the Government of Jamaica has incurred, any expansionary government spending will not have a large impact on output.

Figure 1 indicates that in response to a shock to government spending, taxes increase on impact before decreasing in the second and third quarters and subsequently increasing in the fourth quarter. The increase in the response of taxes to a shock to government spending in the fourth quarters could be explained by the fact that over time, the Government is trying to compensate for their prior increases in spending.

Similarly, private investment (PI) in response to a shock to government spending responds negatively in the first and third quarters suggesting that government spending may crowd out private investment. In addition, private consumption (PC) appears to react to a shock to government spending in the same way as private investment in that it reacts negatively in the first two quarters before falling to zero the fifth quarters. Based on this evidence, it appears government spending displays some crowding-out effect on the other components (PI and PC) of GDP at least in the first couple of quarters.

The low fiscal multipliercould also be explained by the fact Jamaica is a small open[14] economy with a floating exchange rate regime. This can be explained by the fact that small open economies tend to have small fiscal multipliers because there is a higher marginal propensity to import in these economies. In this regard, in an open economy the increase in aggregate demand resulting from expansionary fiscal policy would also be met by a reduction in net exports rather than an increase in domestic production.

Jamaica suffers from a huge trade deficit as can be shown in Figure in 8[15](the graphs showan increasing trend in Jamaica's trade deficit over the periodover the 1997 to 2012). It can be deduced that Jamaica has a high marginal propensity to import and as such we could expect that an increase in income in Jamaica could be met by an increase in imports. This result is consistent with the findings of Mendoza et al (2010) who found that fiscal multiplier is smaller in open economies. The low GSMcan also be attributed to the flexible exchange regime that Jamaica

[14] Openness is defined as the ratio of trade (imports plus exports) to GDP. A country is considered open once this ratio exceeds 60 per cent.

[15]Figure 8 also shows that Jamaica's exports have largely remained constant or decreasing over the period

employs. Mendoza et al (2010) found that countries that employ a flexible exchange rate tend to have a low government spending multiplier.

The low GSM could also be because government spending in Jamaicais largely consumed by debt servicing.Over the period 1993 to 2012, debt service average about 54.2 per cent of total government spending in Jamaica. Thus, most of government resources are consumed by the repayment of debt rather than by providing growth inducement infrastructure such as schools, roads and bridges. In this regard, it can be expected that government spending might not have a major impact on GDP. This is not to say that debt servicing has no positive impact output in Jamaica. In fact most central government in actual owned by Jamaicans companies and individuals and as such these entities and individual earned significant incomes from government debt.

Several studies such as Christiano et al (2009) andScott et al (2008) found that fiscal multiplier is large (greater than one for government spending) when the nominal interest/central bank policy interest rate is constant.They argue that due to fact that the main purpose of central banks is to control for inflation, once there is a significant increase in government spending this usually leads to an increase in the central bank policy interest rate. As a result of this, loan rates in commercial banks usually increase. In this regard, this leads to a reduction in investment and as such this mitigate the impact of an increase in government spending on GDP.

Thus, it is important to take look at the question of whether the stance of the monetary authority has been accommodative to expansionary fiscal policy in Jamaica. As can be seen in Figure 1,in responding to a shock to government spending, the Central Bank (CB) policy interest rate reactspositively in the first quarter and beforefalling zero for the in 4 quarters. This lack of persistence in the CB policy interest rate may be seen as general non responsiveness of the Monetary Authority to fiscal policy. The initial positive response of the CB policy interest can be viewed as the CB responding to inflation in a context when expansionary fiscal policy leads to inflation. Thus, this result cannot be seen as the CB accommodating or non-accommodative fiscal policy in Jamaica.

Some studies such as Guimarães (2010)have suggested that the type of government spending matters in determining the relative strength and size of fiscal multipliers as spending geared

towards capital expenditure will lead to more growth. In this regard, it is important to investigate this issue in relation to Jamaica.

Figure 4[16] shows that the initial response of output to a shock from consolidated capital expenditure (CCE) was found to be 0.001 per cent. This is just about the same as the response of output to a shock fromgovernment spending. Notwithstanding this result, the impact multiplier for CCE was found to be 0.08, which means that an additional dollar in government spending will deliver 8 cents of additional output in the quarter in which it is implemented. The cumulative CCE multiplier on the other hand was found to be the same as that for cumulative GSM.

Even though theCCE impact multiplier is slightlyhigher than the government spending impact multiplier, it is still relatively small. This result along with the long-run CCE multiplier could be explained by the fact that a substantive amount of capital expenditure funds in Jamaica are used for importing goods and services (including overseas contractors). In addition, public entities in Jamaica receive a substantial funding for capital expenditure via grants and loans from multilateral and bilateral agencies. These loans and grants usually carry conditionalities which require the respective public entities to use foreign goods, services and personnel. In this regard, it can be understood why spending on development projects in Jamaica does not have a large impact on output given the leakages via imports and repatriation of profits and incomes. In addition, central government capital expenditure only contributes a small proportion of government spending and by extension a small proportion of GDP. As explained previously, the majority of government spending in Jamaica relates to debt repayment and wages and as such, limits the amount that can be spend on capital expenditure. In fact, over the period 1993 to 2012,capital expenditure average about 8 per cent of total government spending.

[16] In this model Government spending was replaced by Consolidated Capital expenditure while the variables was order in the following sequence; CCE_t,T_t,GDP_t,V_t,I_t,$PC_t$$PI_t$.

Summary &Conclusion

This paper examined the effects of expansionary fiscal policy (increase in government spending and a decrease in taxes) on economic activity (GDP) in Jamaica via fiscal multipliers. This paper used a SVAR method and a quarterly data set between 1993and 2012 to explore the topic. The findings indicate that the effect of expansionary fiscal policy on GDP is weak and not persistent. It was also found that fiscal multiplieris very small on impact and zero over the long run indicating that fiscal policy in Jamaica has a minorimpact on economic activities in the long run. These results were not unexpected and are largely consistent with other findings. In this regard, these results could be explained by the high level of debt that central government has incurred (evidence based on other studies results); the fact that country is a small open economyand the crowding out effect that government spending has on private investmentand private consumption. It was also found that CCE multiplier was found to be higher than the GSM while the long multiplier was about the same. From a policy perspective, it is imperative that the Government of Jamaica seek to reduce its debt level as this severely limits the impact of expansionary fiscal policy.

Due to the limited scope of the study, there are some areas that warrant further investigation. Amuch larger data set could facilitate further research in the area of determining the impact of the exchange regime and the level of openness on the size of fiscal multiplier in Jamaica. In addition, even though the lack of quarterly data on private investment, private consumption and Public Entities public expendituredid not have any major impact on the findings of this study it however, leave the possibility for further research using more accurate quarterly data on these variables.

Appendix

Figure 1-Baseline Variables Response to Government Spending

Response to Cholesky One S.D Innovations ± 2 S.E

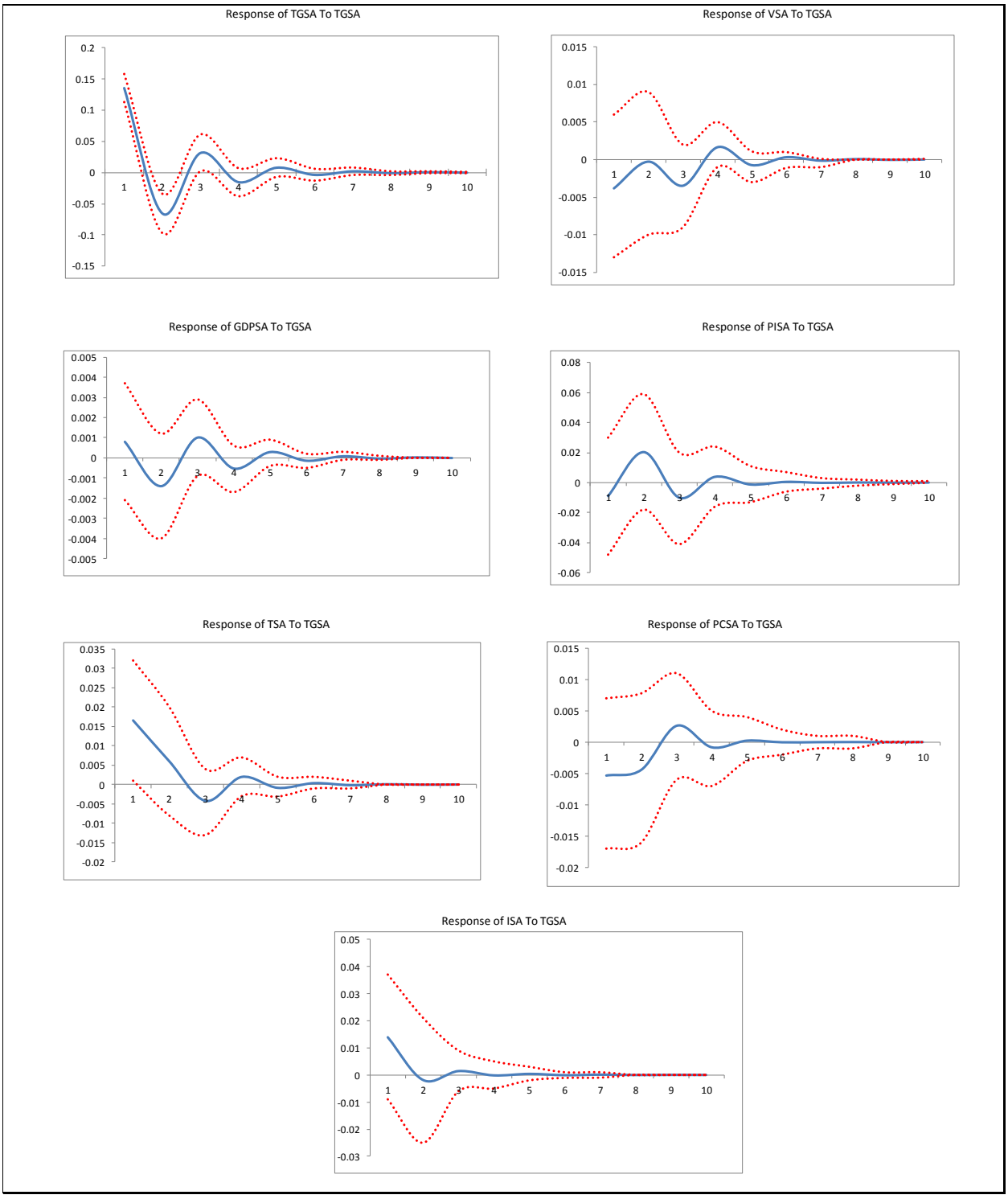


Figure 2-Baseline Variables Response to Taxes

Response to Cholesky One S.D Innovations ± 2 S.E

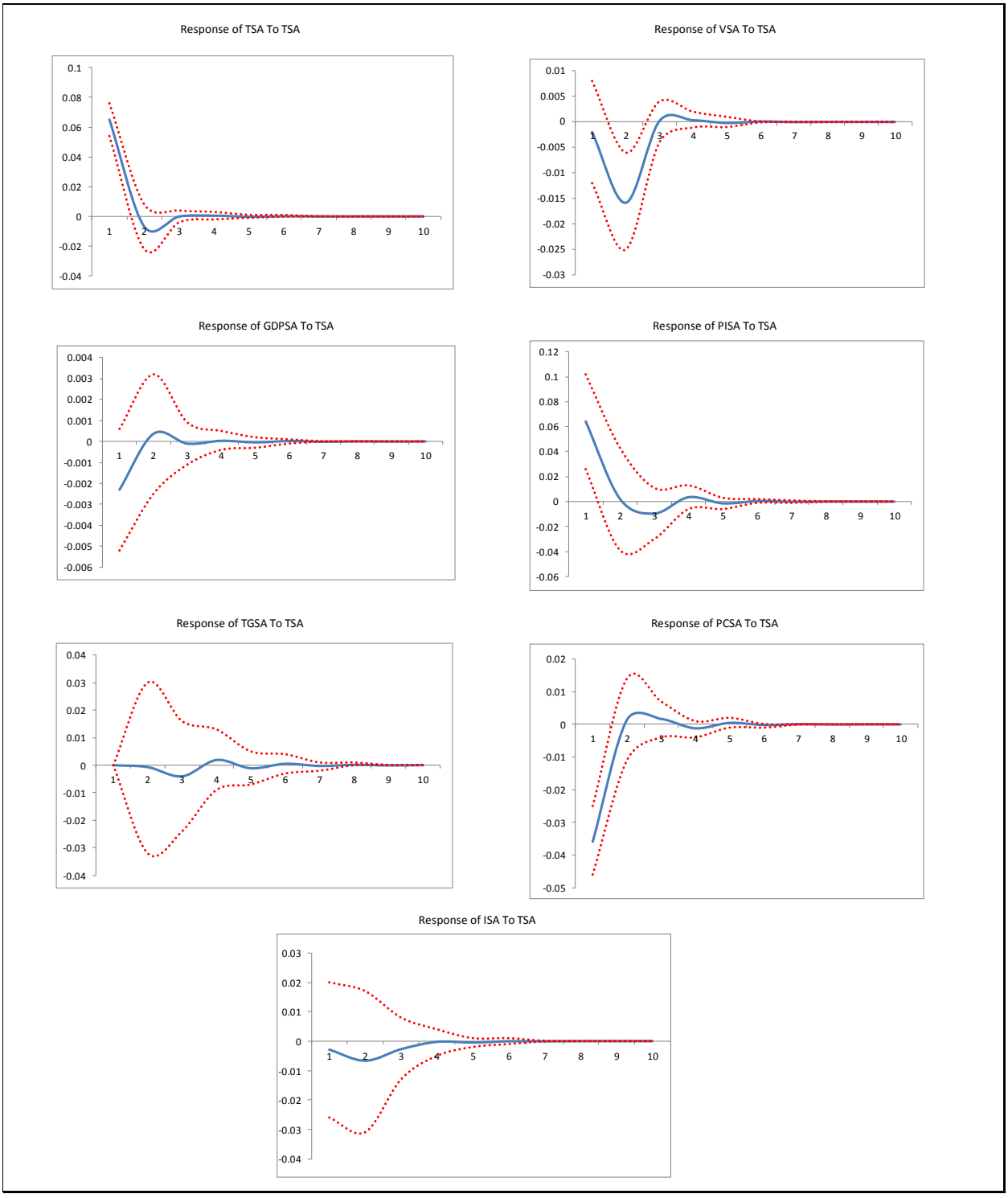
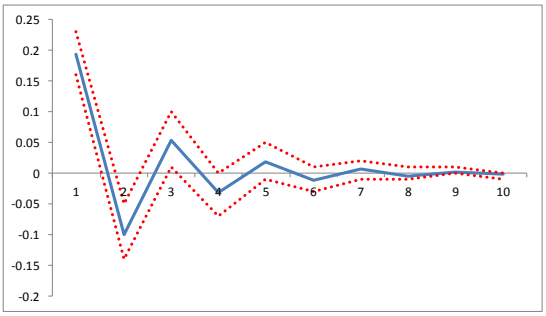


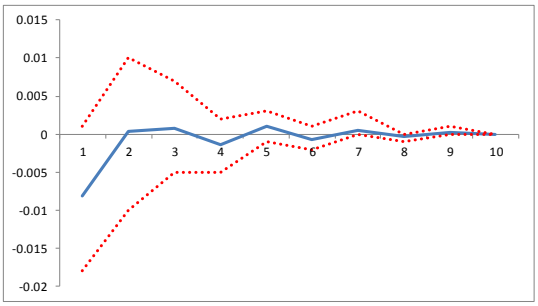
Figure 3-Baseline Variables Response toCCE

Response to Cholesky One S.D Innovations ± 2 S.E

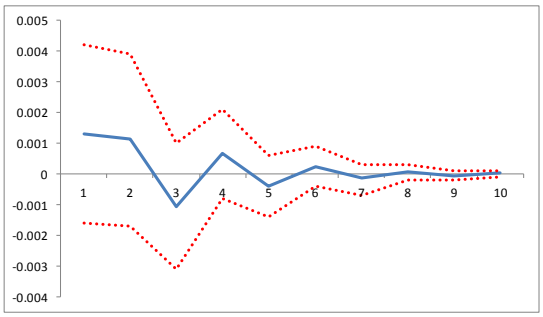
Response of CCESA To CCESA



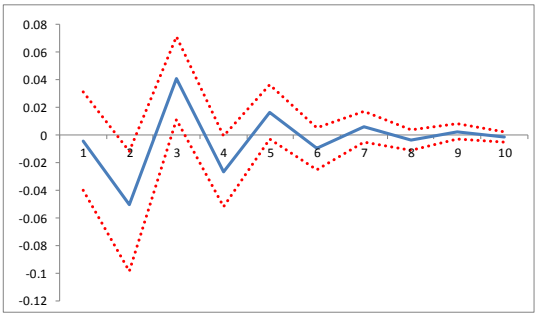
Response of VSA To CCESA



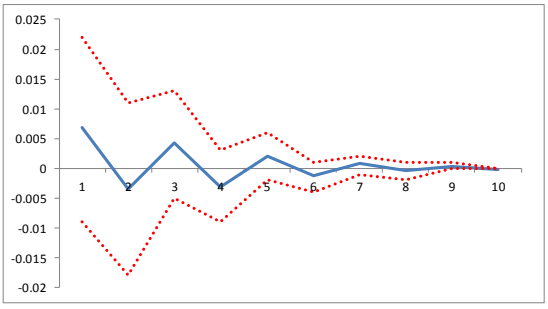
Response of GDPSA To CCESA



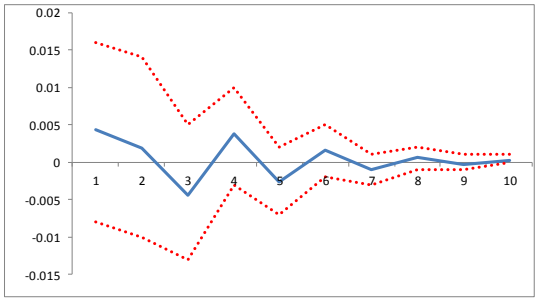
Response of PISA To CCESA



Response of TSA To CCE



Response of PCSA To CCESA



Response of ISA To CCESA

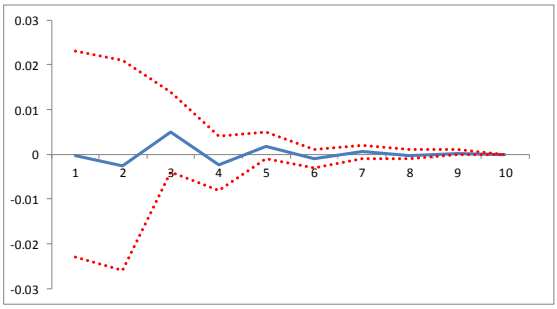


Figure 4 Cumulative multiplier in response to a shock to Government Spending

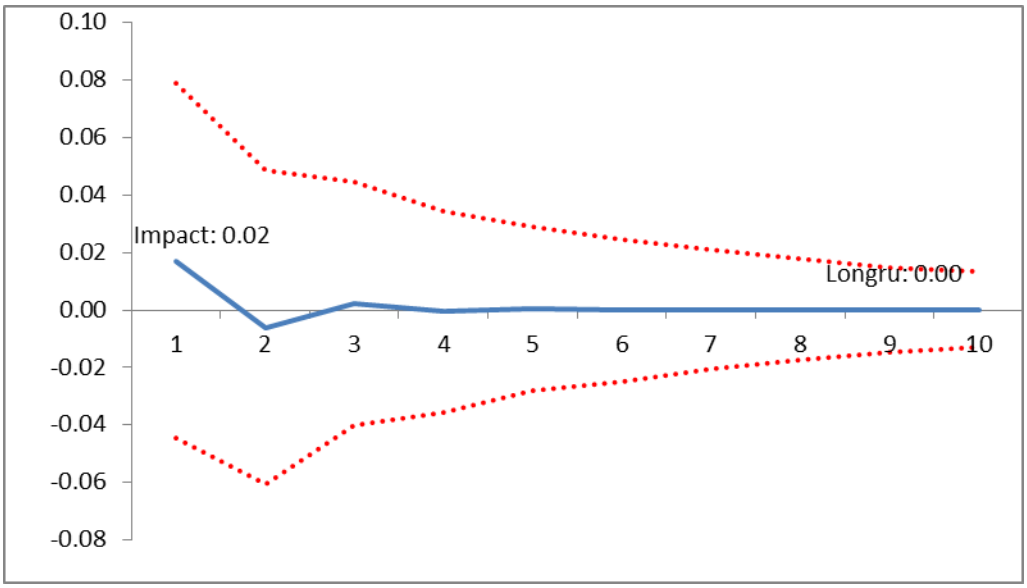


Figure 5 Cumulative multiplier in response to a shock to Taxes

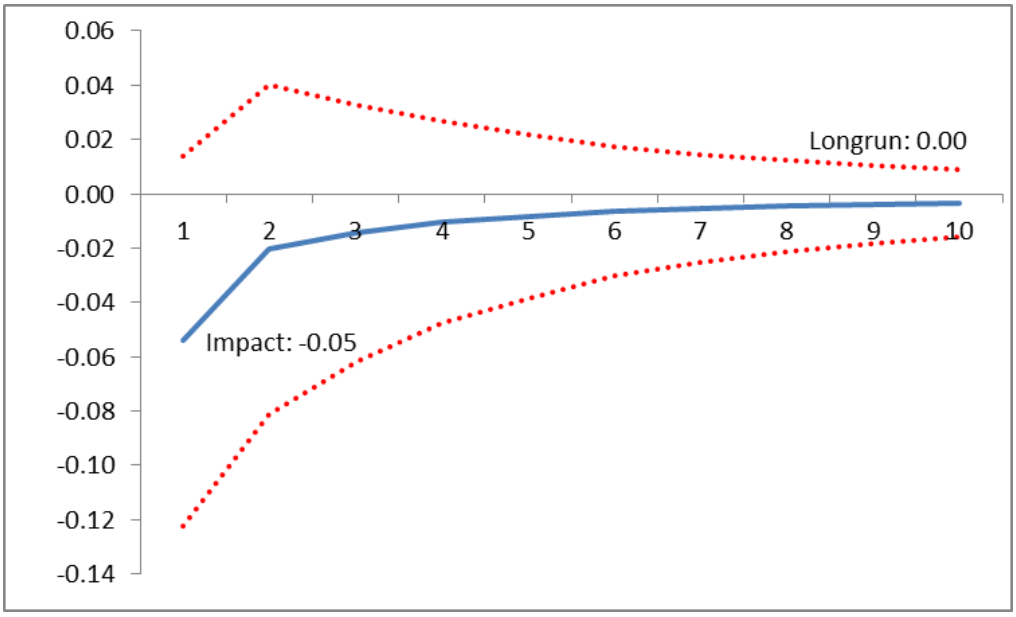


Figure 6Cumulative multiplier in response to a shock toCCE

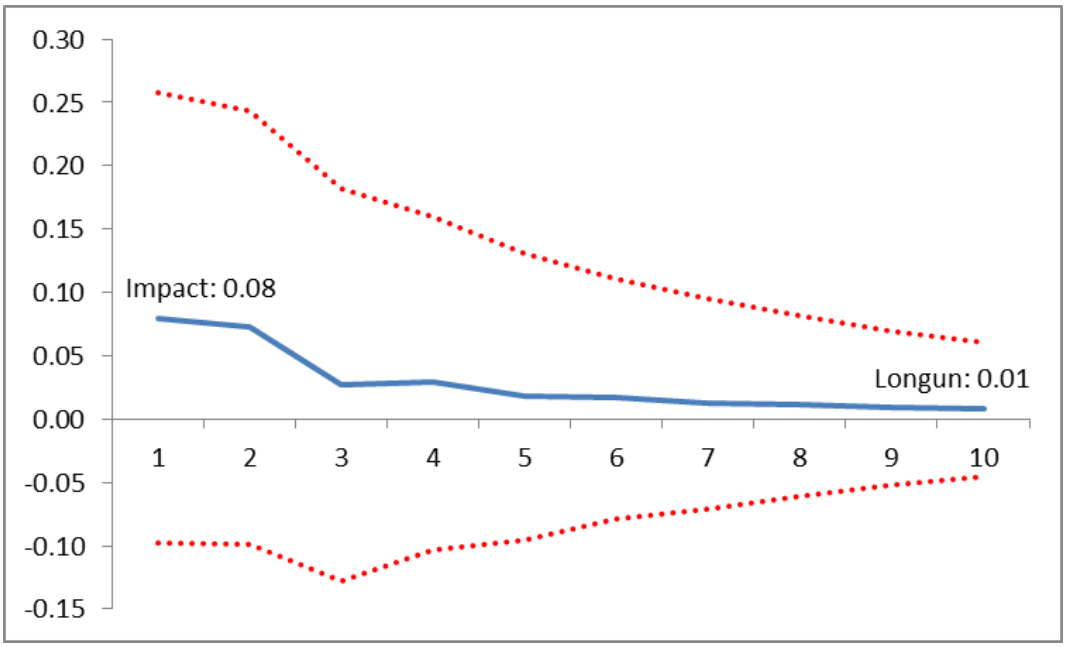


Figure 8 Jamaica trade imbalances 1997 to 2012

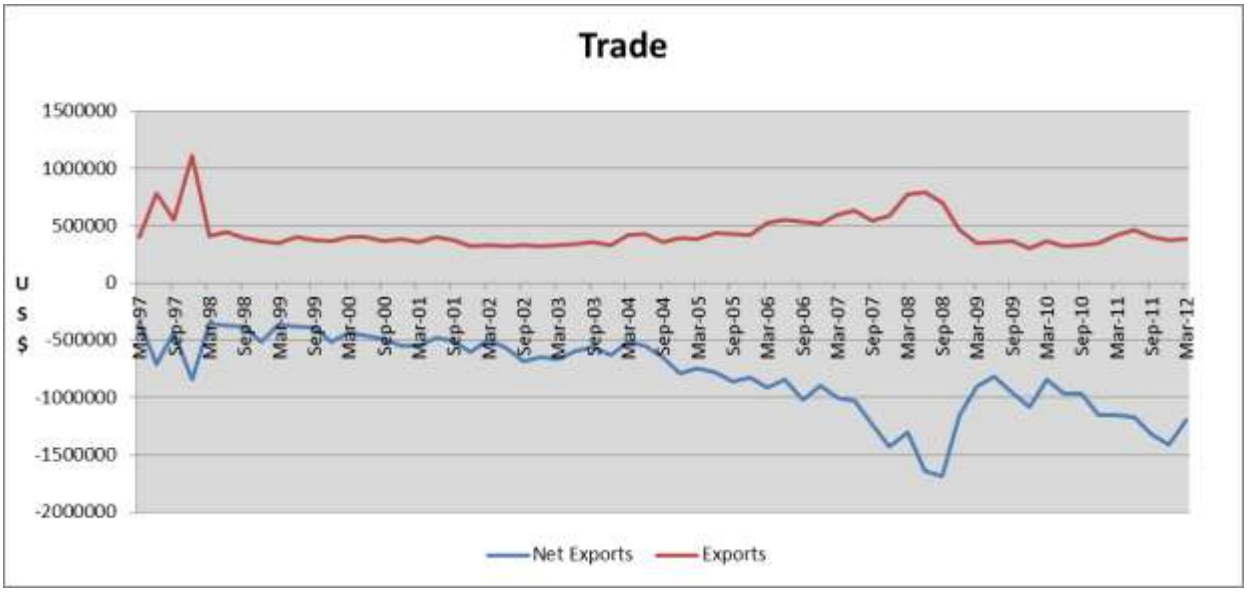


Table 1: Unit Root Test

Variable	Augumented Dickey Fuller test	
	Level	1st Difference
GDPSA	-0.955	-10.631 ***
Government Spending SA	-1.257	-13.585 ***
Tax SA	0.017	-8.957 ***
Debt/GDP SA	-1.578	-4.103 ***
Private Investment SA	-1.904	-13.475 ***
Private Consumption SA	-1.309	-10.670 ***
Monetary Authority Policy Interest Rate SA	-2.200	-7.737 ***
Consolidated Capital Expenditure SA	-0.626594	-15.49673 ***

Notes: *,**,*** are Mackinnon critical valves for the rejection of the null hypothesis of a unit root at the 10%, 5% and 1% levels respectively.

Table 2a: Lag Selection Criteria for the baseline Model

VAR Lag Order Selection Criteria
Endogenous variables: DLTGSA DLTSA DLGDPSA DLVSA DLISA DLPISA DLPCSA
Exogenous variables: C DUMMY DUMMY2 DUMMY3 DUMMY4

Lag	LogL	LR	FPE	AIC	SC	HQ
0	716.6865	NA	2.35E-17	-18.42396	-17.33420*	-17.98924
1	791.9911	126.1862	1.18E-17	-19.1349	-16.51947	-18.09157*
2	845.761	79.92815*	1.10e-17*	-19.26381*	-15.12272	-17.61188

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 2b: Lag Selection Criteria for the baseline Model with Consolidated Capital Expenditure

VAR Lag Order Selection Criteria
Endogenous variables: DLCCESA DLTSA DLGDPSA DLVSA DLISA DLPISA DLPCSA
Exogenous variables: C DUMMY DUMMY2 DUMMY3 DUMMY4

Lag	LogL	LR	FPE	AIC	SC	HQ
0	702.9657	NA	4.34E-17	-17.81242	-16.73093*	-17.38059*
1	772.8766	117.4502*	2.53e-17*	-18.37004*	-15.77445	-17.33365

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 3a: Serial Correlation Test for the baseline Model

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h

Lags	LM-Stat	Prob
1	60.84946	0.1193
2	60.0373	0.1342
3	56.98938	0.2023
4	49.48054	0.4539
5	51.58938	0.3729
6	68.3019	0.0355
7	58.81903	0.159
8	81.11712	0.0027
9	41.09355	0.7817
10	52.63157	0.3354
11	50.15653	0.4273
12	45.26504	0.6253

Probs from chi-square with 49 df.

Table 3b: Serial Correlation Test for the baseline Model with Consolidated Capital expenditure

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h

Lags	LM-Stat	Prob
1	64.64742	0.0663
2	60.79891	0.1202
3	61.09873	0.1151
4	59.76874	0.1393
5	65.52435	0.0574
6	85.66908	0.0009
7	70.32814	0.0245
8	75.66342	0.0086
9	49.05421	0.471
10	71.04576	0.0214
11	38.9592	0.8472
12	63.09215	0.085

Probs from chi-square with 49 df.

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