

How Do Fiscal Rules Impact Investments for Small Open Economies?

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Abstract: This research study investigates the impact of fiscal rules on investments for small open economies (SOEs). A comparative analysis has been conducted on a panel approach of five countries from various regions including the Caribbean, Europe, and Latin America. These small open economies are similar in that they have no influence on the prices of their trading partners. They are similar to the extent that their policies implemented cannot influence the prices of the goods and services traded on the international market. The period of analysis covered the past two decades, ranging from 2000 up to 2020. We particularly chose this time frame in order to cover the impact of the 2008 global financial crisis, the most recent debt restructuring programs in these countries. By means of a multimodal approach centered on panel data modelling, we showed that fiscal discipline associated with the presence of fiscal rules could result in stagnated levels of investment. Most of the countries in our study overperformed in meeting their fiscal targets owing to higher-than-expected revenues. Public debt was low and sustainable owing to favorable debt dynamics. However, these SOEs had low execution of public investment despite holding ample fiscal buffers. It appears therefore that the level of stringency associated with fiscal targets and rules could negatively impact investments. Our empirical results offer insights on strategies that could be considered when designing fiscal rules to strengthen the fiscal framework to ensure macroeconomic debt sustainability without compromising overall investment.

JEL Classifications: C01, C23, E22, E62, F43, H50, H30

Keywords: fiscal rules, debt sustainability, public investment, small open economy.

1. INTRODUCTION

Fiscal rules are fiscal policy constraints defined by numerical limits imposed on variables like budget deficit, public debt or public expenditure, either in absolute terms or depending on some economic variables. The introduction of fiscal rules has been strongly advocated by the IMF, in order to facilitate domestic fiscal policy discipline or surveillance by the IMF (IMF 2009). The primary objective of fiscal rules is to strengthen the fiscal framework to ensure macroeconomic debt sustainability. They are also used to smooth fluctuations in output and stabilize economic fluctuations. These measures cannot be changed frequently and they act as restraints to government spending in good times to ensure fiscal responsibility and debt sustainability. From a theoretical standpoint, there are four (4) categories of fiscal rules. Budget Balance Rules (BBR); applies a ceiling which constrains the actual deficit. This prevents the debt ratio from increasing. Debt Rules (DR); applies a ceiling or explicit limit to the stock of public debt. Expenditure Rules

(ER); applies limits to total, primary and current spending. In this study the expenditure rule is estimated by considering total expenditure given that disaggregated expenditure data was unavailable for each country. This is done by applying a ceiling to expenditure or to the ratio of expenditure to GDP. Lastly, Revenue Rules (RR); set ceilings or floors on revenues, or determine use of windfall revenues. Budget Balance Rules and Debt Rules are the most frequently used and often in combination.

An analysis focused on the impact of fiscal rules on investments is important and this paper explores if such rules have been effective in Small Open Economies (SOEs). Countries with higher rates of savings tend to have faster economic growth than those with lower saving rates. This positive relationship was explained by (Misztal 2010) using a hypothesis where he assumed that increased savings may stimulate economic growth through increased investments. He concluded that a country's economic growth increases if the investment in human or material capital or in scientific research and development (R&D) grows. However, in countries with lower rates of domestic savings, this economic growth could be dependent on access to international financial markets. Financing their investments would require mostly foreign savings as their domestic savings can be quite scarce. For this reason, an analysis of the impact of fiscal rules on savings in small open economies is critical in order to determine which rules are most effective at supporting investments and economic growth in SOEs.

Capital accumulation creates greater opportunities for production and the productivity of a country by providing additional income for countries (Ribaj and Mexhuani 2021). Strong fiscal rules can help governments to achieve the aforementioned outcome from savings and investments. The savings-investments relationship represents an important pillar both for the elaboration of long-run development strategies and fiscal policy mix intended to avoid major economic and social disequilibria in the short run. The savings rate of many Caribbean territories have fallen well below the world average. In 2016, the average Caribbean SOEs' saving or investing average was just over 13% (Ram, et al. 2018). The aggregate regional foreign direct investment (FDI) level is yet to recover to pre-crisis levels (Ram et al., 2018). On the financial side, they are seeing high volatility in capital flows and price variables, such as exchange rates. Additionally, the quality and stock of infrastructure vary widely across countries of the Eastern Caribbean Currency Union and are inadequate to achieve the desired higher growth and social development, due to relatively low investment rates in the region (IMF 2020). A notable contributor to changes in public investment is natural disaster recovery and resilience building and, in many cases, capital expenditure has to be channeled towards infrastructural investment. Case in point, Grenada incurred financial cost at an estimated US\$900 million as a consequence of the 2004 Hurricane Ivan. The hurricane damaged more than 80 percent of the country's building structures (Relief Web 2009).

Fiscal rules could enhance the credibility of fiscal policy and lower the debt levels in SOEs. Many SOEs have racked up unsustainable levels of debt, in part due to low economic growth and vulnerability to economic shocks. Over the last 2.5 decades, average Debt-to-GDP levels of the selected SOEs exceeded the debt rule of 60% (60% of GDP Maastricht threshold). In 2020, Barbados (149%), Grenada (71%), Greece (213%), Ireland (60%) and Peru (35%). Currently there are no revenue rules in the SOEs studied in this research and only two (2) countries; Grenada and Peru, have expenditure rules. The budget balance rule - primary surplus to GDP- is adopted in each of the selected SOEs; Barbados (6%), Grenada (3.5%), Greece (3.5%), Ireland (0.5%) and Peru (1%).

Prior to the Corona Virus pandemic, Barbados made good progress in implementing the Economic Recovery and Transformation (BERT) plan, aimed at restoring fiscal and debt sustainability, rebuilding reserves, and increasing growth. However, due to the fall in tourist arrivals and reduced economic activity, government revenue fell sharply in 2020, and expenditure on medical facilities and supplies as well as social transfers increased. As a result, the primary surplus target was reduced to 1 percent for FY2020/21 (compared to 6 percent prior to the pandemic). To support the adjustment effort over the medium and long term, a fiscal rule was expected to be introduced by mid-2021 (proposed reset structural benchmark to end-June 2021). The design of the fiscal rule will include coverage and the fiscal responsibility legislation will include an escape clause to accommodate the impact of natural disasters and other potential shocks. The rule's introduction had been scheduled for end-April 2020 but had to be delayed to the second half of

2020 in light of the global coronavirus outbreak. The fiscal rule will support the planned reduction of the debt/GDP ratio to 60 percent by FY2033/34 (IMF, 2020).

According to the 2019 IMF Staff Country report, Greece continues to overperform against its fiscal target commitments. The 2018 primary balance (4.2 percent of GDP) was well above Greece's 3.5 percent of GDP commitment and the 2019 primary surplus was projected to exceed Greece's 3.5 percent of GDP commitment. This was possible due to stronger tax revenue collection and growth-dampening under-execution of public investment. Despite overperformance against its fiscal targets, when the pandemic began, Greece's recovery was still unfinished. Nonetheless, the economy contracted by 8.2 percent in 2020, which was better than expected given Greece's high dependence on tourism and pre-existing vulnerabilities. Its public debt spiked in 2020 and 2021 but is expected to decline gradually and remain stable over the medium-term. The pandemic has since highlighted the country's large public investments and social spending gap. That said, recommendations have been made to increase spending on health, education, housing, childcare and unemployment benefits, infrastructure, digitalization, "green" mobility, and human capital (re-skilling/training).

Grenada is advanced with respect to the comprehensiveness of its Fiscal Rules. The Fiscal Responsibility Act outlines the objectives of the fiscal rules and is commonly used in the Caribbean. Accordingly, the Government of Grenada introduced the Fiscal Responsibility Act No. 29 of 2015. The objectives of this Act are "to establish a transparent and accountable rule-based fiscal responsibility framework in Grenada, to guide and anchor fiscal policy during the budget process, to ensure that government finances are sustainable over the short, medium, and long term, consistent with a sustainable level of debt, and for related matters." Grenada has the most comprehensive set of rules; there are four (4) rules and one (1) target. There was compliance with three (3) of the rules, compliance with one (1) with reservation and non-compliance with two (2) (FROC 2016). The fiscal responsibility law (FRL) has been successful in guiding fiscal policy, but its next phase of implementation aims to strike a proper balance between fiscal prudence and much-needed increases in productive spending, as public capital spending has been particularly low in recent years (IMF 2020). Pre-pandemic growth had been rigorous; however, this has been severely impacted by the halt in tourism arrivals. As a result, government announced fiscal support to the economy by deploying its fiscal buffers for an effective response to the crisis.

The outlook for the Irish economy prior to the global pandemic appeared to be positive with strong growth, unemployment nearing historical lows, improved public finances and the economy operating at near full capacity. Despite the favorable outlook of the economy, the country was uniquely vulnerable to Brexit (IMF 2019). That said, policymakers were focused on accelerating fiscal consolidation to build buffers and strengthen resilience of the economy in preparation for a possible major external shock. The policy space built before the pandemic, resulted in a limited fiscal deficit of around 5 percent of GDP in 2020 (IMF 2021) and the policy stance continues to be supportive considering the vulnerabilities of the pandemic and Brexit. The current fiscal space and the Next Generation EU recovery funds are being used to scale up public investment in the near term and public debt-to-GDP ratio is projected to increase to 63 percent this year before declining over the medium-term to 53 percent. Low interest rates, growth as well as the projected return to primary surpluses makes the long-term target of reducing the debt- to-GDP ratio below 50 percent possible.

During 2019 Peru had been overperforming in meeting its fiscal targets owing to higher-than-expected revenues and low execution of public investment. This resulted in a procyclical fiscal stance which was reflected in limited capacity in investment execution. Public debt was low and sustainable owing to favorable debt dynamics and the country held ample fiscal buffers in the form of bank deposits. The pandemic presented an unprecedented challenge and large and broad-based fiscal policy response was essential in containing the pandemic's impact but was initially hampered by poor implementation. However, despite the challenges, Peru's fiscal space held under the current fiscal rules made policy buffers ample and notwithstanding its recent increase, public debt remained low. After the suspension of the fiscal rules in 2020-21, converging back to the fiscal targets will take time in a situation characterized by extreme uncertainty and rising spending needs. Any recalibration of the fiscal rules, which might be considered when

uncertainty has dissipated, should preserve debt sustainability, strengthen credibility, and be clearly communicated.

Rules can apply to government borrowing, structural balance, expenditure or taxes. But government borrowing depends on the cyclical situation: a norm on government borrowing is necessarily pro-cyclical. The debt criterion is difficult to fulfil as, in the short run, a restrictive policy can increase the debt-ratio (Mathieu and Sterdyniak 2012). A rigid rule constrains government expenditure and consumption. It is against this background that there are two critical questions of interest in this study; (1) What are the impacts of fiscal rules on investments in SOEs? (2) How can fiscal rules not currently used by these SOEs, be improved and potentially implemented by governments. The conclusions of such an analysis are both important and timely because we found that countries with SOEs suffer from structural economic imbalances along with large infrastructure and service gaps, particularly following debt restructuring programs. It appears that most of the countries in our study overperformed in meeting their fiscal targets but at the expense of low execution of public investments, resulting in infrastructural gaps. Deficiencies in infrastructure can have significant impacts on output and economic growth. For many of these economies already constrained by rising debt levels and stagnated growth, this is a major concern. This has motivated us to investigate the impact that fiscal rules have on investments in these SOEs (especially since there are limited studies on the effect of fiscal rules on total investment outcomes). We believe that designing effective fiscal rules could significantly narrow these gaps, improve expenditure efficiency, strengthen investment management systems, and boost economic growth.

The remainder of the paper is organized as follows. Section 2 reviews previous research on fiscal rules and design, debt, public investment and growth and identifies our contribution to the literature. Section 3 presents the data and describes the empirical strategy. Section 4 reports the main results and conclusions. Lastly, Section 5 concludes by discussing policy implications and avenues for future research.

2. LITERATURE REVIEW

The objective of fiscal policy is relatively unclear: should it target full employment or the equilibrium of public finances? What is clear is the general impact of fiscal policy on public investments. Some studies found that countries with low saving rates also have low investment rates (Bayoumi, 1990; Dooley, Frankel & Mathieson, 1987; Feldstein & Horioka, 1980). The positive relationship between domestic saving and domestic investment is often viewed as evidence of imperfect international capital flows (Feldstein & Horioka, 1980). Clarity in the literature is also required on how fiscal rules allow countries to run an optimal fiscal policy, savings, investment and debt. Many studies investigate the various linkages between fiscal balances and the economy.

2.1 Alternative Rules and Public Investment

Some authors investigate the impact of alternative rules on public investment, namely the Structural Fiscal Deficit Rule (SFDR) and the Current Deficit Rule (CDR), also known as the golden rule. According to (W. Mendoza, M. Vega and C. Rojas, et al. 2021) because SFDR does not consider cyclical movements in GDP, it gives better predictability of public expenditure as it remains the same during economic booms and busts. In the case of the golden rule, procyclicality is lower than with the fiscal deficit rule and the advantages of this rule are the promotion and protection of capital expenditure (public investment is financed by public debt while current expenditures are financed by fiscal revenues) and its intergenerational equity (beneficiaries pay the projects). The authors calculated the effects of alternative fiscal rules on public investment and macroeconomic variables using a Dynamic Stochastic General Equilibrium Model (DSGE) calibrated for the period 2000- 2019.

2.2 Public Debt, Public Investment and Economic Growth

Isaac Sánchez-Juárez and Rosa García-Almada stated the following about the relationship between public debt, public investment and economic growth: “there is a positive correlation, which is in line with the findings of other researchers. Moreover, it has been shown that public investment is a positive determinant of economic growth”. (Sánchez-Juárez and García-Almada 2016) also found that where public debt may be used as an option to finance public investment, it must be fully utilized for this area and not diverted for other purposes, which is always likely due to the configuration of the incentives of the political class in power. The authors used Dynamic Models with panel data and the GMM to produce econometric results confirming that public debt is positively correlated with public investment and that this in turn generates economic growth.

2.3 Fiscal Rules and Public Investment

The Chilean Rule (a budget balance rule) - from 2001-07, a constant target for the structural balance (surplus of 1 percent of GDP) was defined; in 2008 a new constant target was specified (surplus of 0.5 percent of GDP). In 2009, while the target was a zero structural surplus, a de facto escape clause was used to accommodate countercyclical measures adopted in 2001. This has been found to be successful at accumulating significant savings under normal or favorable macroeconomic conditions i.e., without a recession (Fuentes, Schmidt-Hebbel and Soto 2021). It is for this reason that the authors review the design and operation of the Chilean fiscal rule in the past 30 years. They used a dynamic stochastic general equilibrium model to simulate the response of the Chilean economy to a set of exogenous shocks (productivity, world interest rates, and the terms of trade), with and without the fiscal rule in operation. The model’s aim is to highlight such shocks and their likely effect on public investment and public debt. Lastly, a comparison of pre- and post-fiscal rule periods is carried out, to identify whether the rule has had short or long-term impacts on the level of public investment and/or its trajectory.

Likewise, (Sebastien, et al. 2013) found that fiscal rules can have a procyclical effect on public expenditure, with an emphasis on public investment, particularly in The West African Economic and Monetary Union (WAEMU). They also recognized that strict fiscal rules that target the overall fiscal balance on an annual basis may exacerbate pro-cyclicality. Procyclicality occurs when there is a positive relationship between an economic variable and the overall state of the economy. In this paper, ((Sebastien, Sanchez, Luis, & Varoudakis, 2013) add to previous research by comparing the WAEMU to a large sample of other low-income (LIC) and lower middle-income countries (LMIC) for the period 1995-2012. They analyzed the pro-cyclicality of public investment and current expenditure, along with the pro-cyclicality of the fiscal balance.

2.4 Fiscal Design and Impact on Debt

It is difficult to design fiscal rules that are able to account for all situations. Generally, these rules are based on magic numbers (like budgetary positions in balance), unrelated with macroeconomic equilibrium constraints and little to no economic justification (Mathieu and Sterdyniak 2012). The most common fiscal rule is the budget balance requirement - a ceiling which constrains the actual deficit, however no “ideal” rule or set of rules can be identified. (Sutherland, Price and Joumard 2005) found that to achieve several objectives at the same time often requires that sub-central governments implement more than one fiscal rule. They have also discovered that very few countries apply fiscal rules directly to sub-central government spending. Rather, many countries simultaneously apply limits both to the sub-central budget balance or borrowing and to tax autonomy. The nature of local spending assignments makes expenditure difficult to contain directly via rules-based controls and as a result Sub-central governments are often faced with the challenge of controlling spending despite the increasing demand for services provided to the public. The authors used questionnaire responses and other sources, to give a detailed picture of fiscal rules for sub-central governments in place among several OECD countries.

2.5 The Relationship Between Fiscal Targets, Public Investment and Growth

The paper entitled “Fiscal Rules, Public Investment, and Growth” written by (Servén 2007), found that the standard practice among policy makers is to determine the strength of the fiscal accounts solely on the basis of the cash deficit. A practice which has encouraged governments to contract investment spending particularly during periods of fiscal tightening. The author found this particularly interesting since public infrastructure investment represents a small part of GDP and overall public expenditure. Servén examines the arithmetic of solvency and its practical application to offer an analytical review of the links between fiscal targets, public investment and the adverse effects on growth and fiscal solvency.

2.6 Public Investment and Growth

Project selection and implementation turn out to be important contributors to public capital and growth and hence the economy’s capacity to repay its debts (Gupta, et al. 2011). The authors focused on searching for a relationship between economic activity and the cumulated public investment effort, using the perpetual inventory method for estimating public capital stock. Results suggest that project implementation is the most important component of the overall investment process. This result is driven by LICs followed by project selection. Thus improving project implementation comprising competitive bidding and internal audit, and project selection, can significantly benefit public investment and growth in low-income countries.

2.7 Fiscal Rules in Alignment with Economic Growth

The design of fiscal rules has the potential to affect the growth-friendliness of fiscal adjustment strategies, provided public investment is productive. Authors of the paper “Growth-friendly Fiscal Rules? Safeguarding Public Investment from Budget Cuts through Fiscal Rule Design” (Ardanaz , et al. 2020) found that the behavior of public investment during fiscal consolidations differs significantly depending on fiscal rule design and that fiscal rules which include flexibility features, are useful to protect public investment from budget cuts during fiscal consolidations. Such flexibility features include well-defined escape clauses, and differential treatment of investment expenditures. A sample of 75 advanced and developing countries during 1990-2018 was used to analyze the effect of changes in fiscal rule design over time and across these countries by distinguishing between flexible and rigid fiscal rules. According to the authors, their results showed that “in countries with either no fiscal rule or with a rigid fiscal rule, a fiscal consolidation of at least 2 percent of GDP is associated with an average 10 percent reduction in public investment. Under flexible fiscal rules, the negative effect of fiscal adjustments on public investment vanishes”. Including escape This paper has shown how certain features of fiscal rules can help safeguard public investment during fiscal consolidation periods.

2.8 Fiscal Sustainability in SOEs

The paper by (Wright, Grenade and Scott-Joseph 2017) “Fiscal Rules: Towards a New Paradigm for Fiscal Sustainability in Small States,” discusses key technical, operational, and institutional issues in the design, implementation, and monitoring of fiscal rules that might be relevant for Caribbean countries that currently do not have legislated rules. In this paper the author’s found that the attainment of crucial economic targets depends on governments’ ability to design and manage binding rules to guide an effective fiscal framework. They used a small open economy real business cycle (RBC) model to undertake a simulation exercise in a heuristic attempt to assess the potential impacts of fiscal rules on selected macroeconomic variables as well as on consumer welfare. The simulated results imply that going forward, the design and conduct of fiscal policy should be modified to include appropriate fiscal rules to reduce macroeconomic volatility and enhance welfare. The flexibility of the rules must also take into account the cyclical nature of the economy.

This research review's purpose is to help the reader understand different aspects posed by research on fiscal rules, fiscal design, public investment, debt and growth. This is significant to gain a clear understanding of the links between each of the variables and how they correlate. Recall the IS-LM model, which stands for "investment-savings" (IS) and "liquidity preference-money supply" (LM). It is a Keynesian macroeconomic model that shows how the market for economic goods (IS) interacts with the loanable funds market (LM) or money market. The graph on the IS-LM model implies that during periods of fiscal consolidation (government reduces its expenditure or increases taxes) output falls along with interest rates thereby increasing the level of private investments and reducing overall savings. This underscores the importance of fiscal rules and their impact on investments and savings in the economy.

To the best of the authors' knowledge, there is no literature investigating the impact of fiscal rules on total investment expenditure in SOEs. Taking this into account, the aim of this study is to fill in this gap by using panel data analysis for the past two decades on five countries with SOEs. The main contribution is to analyze the impact of fiscal rules on investments in SOEs.

3. METHODOLOGY

We used annual panel data between 2000-2020 to conduct the empirical analysis and modeled the SOEs fiscal rule by adapting an original version by Ardanaz, M. et. al (2020). The data series selected for the study included: Gross Domestic Product (GDP), Primary Balance (PM), General Government Gross Debt (GD), Total Expenditure (TE), Total Revenue (TR), Total Investment (TI), Inflation (IF) and Interest Payments (IP). The data sets were collected from the Central Bank of Barbados, the Eastern Caribbean Central Bank, World Economic Outlook Database of the International Monetary Fund, World Development Indicators of the World Bank, and the European Statistical System and we analyzed using statistical software Eviews11. The sample included five countries (which would have undertaken a debt restructuring program) as follows: Barbados, Greece, Grenada, Ireland, and Peru. We were unable to provide country-specific results due to insufficient data and so the paper does not address country specific impacts. Rather, it looks at how fiscal rules can be used to drive investments in small open economies. With regards to defining and measuring fiscal discipline, our discussion does not disaggregate pre and post implementation. The measurement of the impact is the same throughout the period under investigation.

The theory that advocates for the implementation of fiscal rules germinated from the "Golden rule of public finances". According to the rule in order to constrain governments from running excessive deficits: current expenditure must be financed through taxation, while investment which will benefit future generations may be financed through borrowing. This rule can be more precisely defined as follows:

Let us assume that a country wishes to maintain a public debt level equal to its public capital stock. Public debt in real terms varies as:

Where $r - \pi$ denotes real interest rate and S_p is the primary government balance:

$$D = D_{-1}(1 + r - \pi) - S_p \quad (1)$$

The public capital stock level varies as:

$$S = S_p - RD_{-1} - (1 - \delta k_{-1} + \pi D_{-1}) \quad (2)$$

Government borrowing should equal net public investment plus debt depreciation due to inflation. From a Keynesian perspective, a certain level of public debt and deficit is necessary to ensure that demand equals potential output. Public deficits result from the macroeconomic situation and are not at the origin of this situation. The public debt rule and the budget balance rule will be investigated to analyze their impact on investments. To answer our research questions, we formulated the following hypothesis:

Hypothesis 1 (H1): there is a significant relationship between investment and the primary balance, general government gross debt, total expenditure, gross domestic product, inflation, and interest payments.

Consistent with the literature discussion the model maybe specified as the following:

$$\text{Model: } I_{it} = \alpha_0 + \alpha_1 BB_{it} + \alpha_2 DR_{it} + \alpha_3 ER_{it} + \alpha_4 GDP_{it} + \alpha_5 IF_{it} + \alpha_6 IP_{it} + \varepsilon_{it} \quad (3)$$

I_{it} = Investments
 BB_{it} = Budget Balance Rule
 DR_{it} = Debt Rule
 ER_{it} = Expenditure Rule
 GDP_{it} = Gross domestic product per capita, constant prices
 IF_{it} = Inflation, end of period consumer prices
 IP_{it} = Interest payments (% of revenue)
 ε_{it} = Error Term
 i = the country
 t = the period analyzed (i.e., 2000–2020)

The fundamental building block of fiscal analysis is the inter-temporal budget constraint. The identity can be expressed in mathematical notation as:

$$B_t - B_{t-1} = I_t - X_t - (M_t - M_{t-1}) \quad (4)$$

Hence the subscript t indexes time, which is usually measured in years; B_t is the quantity of public debt at the end of the period t , I_t is interest payments, X_t is the primary balance (revenue minus noninterest expenditure), and M_t is the monetary base at the end of the period t .

The starting point is the standard debt accumulation equation:

$$d_t = \frac{1+i_t}{1+y_t} d_{t-1} - pb_t, \quad (5)$$

Where d_{t-1} , y and pb_t label the initial debt-to-GDP ratio, the “nominal” growth potential of the economy, reflecting trend dynamics in growth and prices, and the primary balance-to-GDP ratio respectively.

Second, the primary balance ratio can be decomposed into a structural cyclical component:

$$pb_t = capb_t + \mu og_t, \quad (6)$$

Where $capb_t$ labels the cyclically-adjusted primary budget balance ratio, μ the cyclical sensitivity of the budget balance and og_t the output gap.

4. RESULTS

This section reports the findings of the investigation on the analyses conducted on the variables of interest in order to examine the impact of fiscal rules on investments for our sample of countries with small open economies: the primary balance, general government gross debt, total expenditure, gross domestic product, inflation, and interest payments.

The first round of analyses conducted by us presents the descriptive statistics in (Table 1). The variable definitions are displayed in Table A (Appendix). According to the standard deviation values, the variable registering the largest volatility was GDP, while the variables with the smallest volatility were the budget balance rule, inflation and interest payments. In terms of skewness, nine variables were right skewed and one variable was left skewed. The kurtosis values for three of the variables of interest were below the threshold of three. By means of the Jarque-Bera test, we investigated whether the data were normally distributed. Test results indicated that our variables were non-normally distributed at the 1% level of significance.

Table 1. Descriptive Statistics

	<i>BB</i>	<i>DBS</i>	<i>DR</i>	<i>ER</i>	<i>GDP</i>	<i>IF</i>	<i>I</i>	<i>IP</i>	<i>S</i>	<i>TE</i>
Mean	-2.789	85.602	85.406	33.061	613.405	2.264	20.186	11.327	15.479	52.534
Median	-2.202	82.140	79.562	30.833	197.204	2.177	18.942	10.564	14.379	51.827
Maximum	5.879	213.101	213.101	65.032	3270.790	9.559	44.794	26.904	36.262	187.874
Minimum	-19.260	19.963	19.963	18.593	6.109	-2.535	8.502	2.917	3.882	0.366
Std. Dev.	4.651	48.008	48.221	10.911	864.240	2.407	6.606	5.715	7.100	48.921
Skewness	-0.460	0.590	0.587	0.759	1.695	0.344	1.184	0.864	0.915	0.446
Kurtosis	3.544	2.640	2.612	2.642	4.579	3.156	4.974	3.433	3.510	2.216
Jarque-Bera	5.004	6.651	6.689	10.648	61.160	2.178	41.584	13.882	15.804	6.174
Probability	0.082	0.036	0.035	0.005	0.000	0.336	0.000	0.001	0.000	0.046
Observations	105	105	105	105	105	105	105	105	105	105

The second round of analyses were focused on testing the correlations between the predictors in order to check for multicollinearity issues. The Pearson correlation coefficients are presented in Table 2.

Table 2. Correlation Matrix

	<i>BB</i>	<i>DBS</i>	<i>DR</i>	<i>ER</i>	<i>GDP</i>	<i>IF</i>	<i>I</i>	<i>IP</i>	<i>S</i>	<i>TE</i>
BB	1									
DBS	-0.142	1								
DR	-0.135	0.999	1							
ER	-0.366	0.710	0.707	1						
GDP	0.123	-0.121	-0.121	-0.335	1					
IF	-0.107	-0.191	-0.187	-0.180	-0.151	1				
I	-0.048	-0.478	-0.469	-0.257	-0.027	0.124	1			
IP	-0.433	0.451	0.449	0.107	-0.054	0.117	-0.390	1		
S	0.289	-0.601	-0.590	-0.390	-0.117	-0.106	0.662	-0.526	1	
TE	-0.026	-0.087	-0.082	0.291	-0.359	-0.159	0.159	-0.487	0.309	1

As can be seen from Table 2, all correlations registered low to moderate levels. Therefore, we concluded that multicollinearity would not pose any problems for the econometric estimations and conclusions derived from these estimations.

At this stage of the analyses, we focused on econometric estimations:

The econometric model 1 (see Table 3) investigating investments (I), three of predictors proved to be significant. BB and ER had a negative effect, while IF exerted a positive effect. In this sense, when BB rose by one unit, I would mitigate by 0.7 units. Should IF augment by one unit, I would also increase by 0.2 units. Moreover, a one-unit increase in ER would be followed by a decrease of 0.6 units in I.

Table 3. Econometric Model 1

Model 1	
	I_{it} $= \alpha_0$ $+ \alpha_1 BB_{it}$ $+ \alpha_2 DR_{it}$ $+ \alpha_3 ER_{it}$ $+ \alpha_4 GDP_{it}$ $+ \alpha_5 IF_{it}$ $+ \alpha_6 IP_{it}$ $+ \varepsilon_{it}$
C	41.5189 (9.2078)
BB	-0.6790* (-4.5283)
DR	0.0113* (0.5198)
ER	-0.6002 (-4.6307)
LOG(GDP)	0.0006 (0.3128)
IF	0.2783* (1.2455)
IP	-0.4705 (-3.2996)
R-squared	0.532156
Durbin-Watson stat	1.408741

Note: Robust *t*-statistics are indicated in parentheses; * denotes statistical significance at the 5% level.

5. DISCUSSIONS

With regards to the cross-section effects estimations, the econometric model revealed relevant results that are consistent with the literature. According to our expectations the predictors Budget Balance Rules (BB) and Expenditure Rules (ER) were both negatively related to Investment (I). This relationship tells us that in the face of fiscal discipline there is a tradeoff between current expenditure and productive capital expenditure. When fiscal adjustments are made and the stringency of these fiscal rules are increased with the aim of achieving corresponding increases in the primary surplus, investments will be negatively impacted. The rationale is that during periods of consolidation there could be a crowding out effect and so rather than cutting current expenditure, capital expenditure will be reduced instead. This fiscal adjustment strategy could be ineffective, particularly in cases where investment projects not only “pay for themselves” but also have the ability to yield future income. According to (Servén 2007), in Latin America, the decline in public infrastructure investment was accompanied by the opening of most infrastructure sectors to private initiative. But the results were uneven: total investment (public plus private) fell in all infrastructure sectors except telecommunications. In fact, the countries that managed to attract higher private investment into such sectors were those that had maintained higher levels of public investment, which suggests that private and public investment may complement rather than substitute each other. That said, in governments’ drive towards fiscal discipline, the ideal alternative would be to impose fiscal targets and rules that do not result in the fall in total investment (reflecting the decline in public investment and the limited response of private investment).

Also revealed by the econometric model is a possible explanation as to why the expenditure rule is not widely used by the countries being examined. The need to comply with targets set by stringent expenditure rules may result in easy cuts in investment spending. This could potentially amplify volatility associated with pro-cyclical expenditure cuts, particularly in public and private investments (from the previous argument the literature suggests that public and private investment complement each other). A large portion of current expenditure is usually made up of wages, transfers, and debt service, therefore making short term cuts difficult. In the event of unforeseen adverse shocks, investment spending will be used to finance the unexpected changes in revenue or current expenditure, making investments a major shock absorber (Sebastien, et al. 2013). This tendency to cut investment expenditure during “bad times” provides justification for underutilizing the expenditure rule and underscores the importance of a rules-based framework (the previously mentioned golden rule), which prevents the government from running current account deficits by allowing borrowing to finance investments. Spreading the costs of investments over time without violating fiscal targets, allows government to dedicate more resources to investing in revenue-generating assets that “pay for themselves”.

Fiscal rules are the instrument of choice to correct excessive deficits (IMF 2018). It is noteworthy that fiscal rule adoption has been linked to improvement in fiscal balances. However, is this the best way to measure/assess the quality and efficacy of fiscal rules? Well-designed fiscal rules are described as being simple, flexible (provision of escape clauses) and enforceable (incentives for compliers and penalties for non-compliers). Our approach is that rather than relying solely on these three properties as a measure of efficacy, perhaps it would be useful to also consider their impact on economic variables such as investment, thereby affecting economic growth. Addressing this consideration could be the key to striking a balance between constraining excessive fiscal deficits and attaining sustainable economic growth.

The preceding discussion does not imply that governments should stop using conventional fiscal rules as a means to strengthen the fiscal framework to ensure macroeconomic debt sustainability. The recommendation is that governments should reassess, redesign, and improve the quality of their fiscal rules to make them more effective at ensuring fiscal discipline but doing so without crowding out investment expenditure.

Due to the broad nature of the initial research question “How Does Fiscal Rules and Debt Sustainability Impact Savings and Investments in SOEs”, the research paper lacked focus. We therefore made the decision to narrow the focus and changed the topic to “How Do Fiscal Rules

Impact Investments in Small Open Economies". We will develop a separate paper which looks at the impact debt sustainability on investments. In addition to this we encountered methodological limitations as it relates to analyzing the relationship between fiscal rules and investments. We believe there is a more superior method to help us analyze this relationship that could enhance our research and so, going forward we intend to use the loanable funds model. This model looks at the short and long run changes in interest rates and the impact it has on the demand and supply of loanable funds. The model implies that in the short run, decreases in the interest rate would cause aggregate demand to increase because there is more investment spending. However, the crowding out effect occurs when a government runs a budget deficit and, as a result, causes a decrease in private investment spending.

6. CONCLUSIONS

Our study has shed some light on the importance of designing effective fiscal rules and how they impact investments in SOEs. Although the presence of a fiscal rule in a country is associated with achieving fiscal discipline, it is important for governments, especially those of developing countries to have well-designed fiscal frameworks that allow for debt sustainability while creating more fiscal space and to free up resources for investment in human and physical capital. The literature has supported our view that investment and economic growth are positively correlated, and the results of our study implies that the type of fiscal rule(s) enacted could impact the level of investment in small open economies. As mentioned in the discussion, our econometric model revealed a negative relationship between investment and the budget balance and expenditure rules. This relationship is concerning since investment plays a key role in the promotion of the governments' objectives of achieving economic growth and improving the welfare of its citizens. We acknowledge that the implementation of a fiscal rule framework is necessary in the absence of fiscal discipline, transparency, and sustainable levels of debt. However, the absence of economic growth at the expense of fiscal discipline and management seems ineffective and counterproductive. This study therefore recommends that fiscal rules not only give priority to debt sustainability but also to investment, thereby attaining and enhancing sustainable economic growth.

The findings of our study, conducted on 5 countries from the Caribbean, Europe, and Latin America, with the help of panel data analysis, will entail key policy implications for governments as they try to find the most effective fiscal response to counter economic shocks. Recovery plans for economic shocks such as the COVID-19 pandemic will require investment (both public and private) to be scaled up. Quality investment will need to be prioritized in areas such health care systems, infrastructure, education, and green technology such as wind and solar energy. The pandemic has highlighted the importance of having a fiscal framework that not only encourages fiscal discipline, but also supports investment and economic growth. Most of these SOEs were already faced with constraints imposed by fiscal rules enacted in the past to ensure fiscal discipline prior to the pandemic. While most of them were achieving and in some cases overachieving their fiscal targets, this was met with large investment spending gaps. Fiscal rules such as the expenditure rule, can induce lower levels of public investment. Expenditure rules do not specify the kinds of spending that need to be contained to ensure compliance, which leads to excessive cuts in capital spending (IMF 2018). This effect is most striking in developing economies. Developing economies who often have large, growth and development needs. That said, National governments from various countries with SOEs across the world should strive to strengthen their fiscal framework by designing and enacting rules that not only aim to establish a link between numerical limits and fiscal objectives, but also seeks to increase quality investment spending.

7. APPENDIX

<i>Abbreviation</i>	<i>Description</i>	<i>Indicator</i>
<i>BB</i>	Balance Budget Rule	Primary Balance
<i>DR</i>	Debt Rule	General Government Gross Debt
<i>ER</i>	Expenditure Rule	Total Expenditure
<i>GDP</i>	Gross Domestic Product	Gross Domestic Product at Current Price
<i>IF</i>	Inflation	Inflation, end of period consumer price
<i>IP</i>	Interest Payments	Interest Payments (% of revenue)
<i>S</i>	Savings	Gross national savings (% of GDP)
<i>I</i>	Investments	Total Investments
<i>DBS</i>	Debt Sustainability	Debt-to-GDP Ratio

Table A. Variable Descriptions

FISCAL RULES FOR EACH COUNTRY				
Country	Budget Balance Rules (BB)	Debt Rules (DR)	Expenditure Rules (ER)	Revenue Rules (RR)
Barbados	6% Primary Surplus/GDP	60% of GDP	n/a	n/a
Grenada	3.5% Primary Surplus/GDP	60% of GDP	2% Expenditure Ceiling	n/a
Greece	3.5% Primary Surplus/GDP	60% of GDP	n/a	n/a
Ireland	0.5% Primary Balance/GDP Ceiling	60% of GDP	n/a	n/a
Peru	1% Primary Balance/GDP Ceiling	60% of GDP	4% Expenditure Ceiling	n/a

Source: Fiscal Rules at a Glance (IMF 2017)

Table B. Fiscal Rules for Each Country

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