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FISCAL RIGIDITIES AND THEIR EFFECTS IN GHANA:
WHAT SHOULD THE GOVERNMENT DO?

Fiscal Rigidities and their Effects in Ghana:
What Should the Government Do?

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Abstract

In spite of the fact that many reasons are usually used to justify the presence of fiscal rigidities, they have been found to pose serious fiscal and macroeconomic difficulties to some countries, particularly those in Latin America, since they make governments lose the discretion and flexibility to use fiscal policy to address emerging fiscal and macroeconomic challenges. Yet, fiscal rigidities have not received the needed attention in Africa in terms of research. We therefore study in this paper fiscal rigidities and their fiscal and macroeconomic effects in Ghana. We find that fiscal rigidities have significant negative effects on Ghana's fiscal and macroeconomic outcomes. Thus, a high degree of fiscal rigidity, as measured by the size of total rigid expenditure relative to total revenue and grants, has historically led to very poor fiscal and macroeconomic outcomes in Ghana, and vice versa. In fact, we find that the fiscal and macroeconomic difficulties the country is currently going through are largely due to fiscal rigidities that have now reached alarming proportions, which are comparable only to the state in which the country found itself prior to the HIPC debt reliefs. We have therefore provided in this paper a number of recommendations that, we believe, can reduce the degree of rigidity in the country's budget in order to reverse the current poor fiscal and macroeconomic performances.

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1.0 Introduction

Effective fiscal management has long been seen as critical to economic growth and development. Economists have therefore devoted a considerable amount of time to studying fiscal institutions that may lead to improved fiscal management. In the last two decades, international development agencies have spent increasing amounts of money to help reform budgetary institutions in the developing world. Oxford Policy Management, for instance, *reports that "since the mid-1990s, there has been a surge of interest among international development agencies in the way public sector budgets are set, managed, and reported on. OECD DAC figures suggest that investment in activities related to strengthening public financial management has risen from $85m in 1995 to almost $1,000m by 2007. This reflects not only an increased demand for transparency in the way aid is used, but also recognition that effective public financial management (PFM) is pivotal to economic and developmental success"* (Oxford Policy Management, 2011).

What has not received enough attention on the part of both researchers and international development agencies in the quest for effective fiscal management is the degree of rigidity in the public budget. Yet, the degree of budgetary rigidity or inflexibility has long been a major concern for fiscal policy makers. Echeverry, Fergusson and Querubin (2005), for instance, argue *that "… the degree of rigidity or inflexibility in budget preparation, a prime preoccupation for policy makers and in particular for finance ministers since a long time ago, has been relatively unexplored."*

Interestingly, most of the existing applied research on fiscal rigidities is in regard to countries in Latin America (see, for instance, Allier (2006); Echeverry, Bonilla, and Moya (2006); Podesta (2007); Almeida (2009a and 2009b); Echeverry, Navas and Clavijo (2009); Cetrangolo, Jimenez and Castillo (2010); etc.). Research focusing on fiscal rigidities in African countries is hard to find. In fact, to the best of our knowledge, there is no published research dedicated to studying fiscal rigidities in Ghana. Yet, despite the fact that some level of fiscal rigidity is not only unavoidable but may also be justifiable, there is evidence, particularly from Latin America, that shows that a high degree of fiscal rigidity can pose a serious challenge for fiscal management, which can seriously undermine economic growth and development. Fitch Ratings, for example, found in 2013 that fiscal rigidities had weakened the creditworthiness of Latin American countries. According to Fitch Ratings, fiscal rigidities reduced the quality of fiscal adjustments in Latin American countries following the global financial crisis, as public spending tilted in favor of current spending as against investment spending, which hampered investment in infrastructure, capital accumulation, competitiveness, and GDP growth in these countries.

This paper is therefore intended to help fill the gap by studying fiscal rigidities and their effects in Ghana. The paper is a follow-up to our previous work (IFS Occasional Paper No. 7, 2016) on revenue earmarking, a type of fiscal rigidity. The paper seeks to answer the following questions: (i) What is the extent of rigidity in Ghana's budget and how have fiscal rigidities behaved historically in Ghana? (ii) What are the fiscal and macroeconomic effects of fiscal rigidities in Ghana? (iii) What should the government do in the face of the difficulties and challenges posed by fiscal rigidities?

The rest of the paper is organized as follows. Section 2 discusses conceptual issues. In this section, we define fiscal rigidities and discuss the reasons for their occurrence. We also discuss the effects of fiscal rigidities in general terms. Section 3 discusses the behavior of fiscal rigidities in Ghana since 1993. Section 4 discusses the effects of fiscal rigidities in Ghana. Section 5 provides policy recommendations, while Section 6 concludes the paper.

2.0 Conceptual Issues

2.1 What are Fiscal Rigidities?

Fiscal Rigidities are institutional, legal, contractual or other constraints that limit the ability of the government to change the size and structure of the public budget, at least in the short term. Fiscal rigidities therefore make fiscal authorities lose discretionary powers over the public budget to the extent of the rigidities. It is important to understand fiscal rigidities within the context of a specified time frame, since in the long enough term, most rigid budgetary items can be changed through new arrangements.

Fiscal rigidities or inflexibilities are classified into three groups: Expenditure rigidities, Revenue rigidities and other rigidities. Expenditure rigidities originate from a set of rules that require compulsory payment of certain expenditures. Revenue rigidities emanate from rules that pick income sources and destine them for specific use (earmarking). Other rigidities are usually para-fiscal resources that are outside the discretion of fiscal authorities in the short term, which are normally allocated to private and other entities for reasons such as the need to promote given sectors of the economy. Commonly cited examples of other rigidities are tax holidays and tax exemptions, which are usually treated as tax expenditures in the public budget.

Because budget decisions result directly and indirectly from collective processes involving a wide range of competing political actors, rigidities arise from the desire of some actors or interest groups to protect their slices of the public budget from other actors through institutional, legal or contractual arrangements. Cetrangolo et al (2010) point this out forcefully as follows: *"The establishment of budgetary rigidities might then be seen as a response to the dispute over scarce resources, and they serve to demonstrate how different actors manage to "defeat" or "defend" themselves' from other actors involved in the struggle over the distribution of resources in society. In very general terms, the problem of inflexibility, as is the case with budgets in general, is essentially a question of politics."* Echeverry, Ferguson and Querubin (2005) see the issue of fiscal rigidities as an application of the Tragedy of the Commons, where each group worries about obtaining the greatest possible amount of resources without thinking of the aggregate consequence of this behavior.

2.2 Reasons for (or Causes of) Fiscal Rigidities

We discuss in this subsection reasons for (or causes of) fiscal rigidities in detail. The discussion follows closely the rigidities typology proposed by Cetrangolo et al. (2010). According to this typology, there are seven reasons for the occurrence of fiscal rigidities.

First, some fiscal rigidities occur because of the application of the benefit principle of taxation. This principle states that payers of certain taxes should be the exclusive beneficiaries of the commodities provided from the tax revenues. This is to ensure efficiency in public service delivery, since, like private commodities, marginal benefits can be linked to marginal costs. Thus, the taxes involved, which are normally earmarked for the purpose leading to fiscal rigidities, act as quasi-prices in resource allocation. Social security earmarking, which benefits only the contributors, is an example of this kind of rigidity in Ghana.

Second, some rigidities are created in the public budget using the 'merit good'' argument. Here, certain goods or services are considered to be of so high a priority that they merit a minimum spending requirement. This is usually implemented through revenue earmarking, thereby creating fiscal rigidities. Earmarking for social and economic programs such as education, health, agriculture, etc. is usually justified using the 'merit good' argument. The Ghana Education Trust Fund (GETFund), the National Health Insurance Fund (NHIF), the Venture Capital Trust Fund, and the Ghana Infrastructure Investment Fund (GIIF) are the fiscal rigidities arising from the 'merit good' argument in Ghana.

Third, some rigidities arise from the relationship between different levels of government. Here, rules are established dictating budgetary transfers to lower levels of government from the central government as, among other things, a means of bonding the lower levels of government to the center. The rules governing the transfers, which lead to earmarking and thus fiscal rigidities, are needed to avoid conflicts and misunderstanding among the levels of government. The District Assemblies Common Fund represents this kind of fiscal rigidity in Ghana.

Fourth, some fiscal rigidities arise from macroeconomic dynamics. A form of this kind of rigidity arises from debt accumulation, which results from the desire to borrow to expand current and/or future output. In some instances, there is a clear intergenerational conflict regarding debt accumulation, since much of the borrowing may be due to the willingness of the current generation to prioritize their consumption over the future ones. Whatever the case may be, borrowing and thus debt accumulation lead to fiscal rigidities in terms of debt service expenditure, since governments that agree to borrow have to meet their contractual obligations. Another form of fiscal rigidities that arise from macroeconomic dynamics are binding inflation adjustment clauses in certain kinds of spending such as wages and salaries and pension payments. In Ghana, there are no explicit binding inflation adjustment clauses.

Fifth, it has become a standard practice internationally that when a country receives extraordinary revenues (i.e. revenues outside the country's traditional sources), the government is not permitted to have full discretion over the use of the revenues. This is particularly true when the revenues come from non-renewable resources, as civil society organizations as well as the general public become highly interested in the manner such revenues are put to use to ensure sustainable growth and development. Therefore, in the presence of extraordinary revenues, rules are normally written dictating how the revenues should be used, leading to fiscal rigidities. In Ghana, the Ghana Petroleum Funds (GPFs) (i.e. the Ghana Stabilization Fund (GSF) and the Ghana Heritage Fund (GHF)) and the earmarked transfers to the Ghana National Petroleum Corporation (GNPC) represent this kind of fiscal rigidity.

Sixth, *disputes or friction within the public sector itself* also generate fiscal rigidities. One form of this rigidity results from the consideration that certain public sector institutions need explicitly protected sources of income through earmarking because they are of high importance to the state. In Ghana, this form of rigidity arises from the argument that ministries, departments and agencies (MDAs) that generate revenues for the state need special treatment in order to facilitate their revenue generation through retention of specified portions of revenues they generate. Ministries, departments and agencies' (MDAs) retention of internally-generated funds (RIGFs) therefore represents this form of rigidity in Ghana. Another form of rigidity arising from dispute or friction in the public service itself is politically inflexible expenditures such as wages and salaries for civil servants and other public sector workers. Because dissatisfaction on the part of civil servants and other public sector workers can lead to strikes and other industrial actions, which can bring government business to a standstill, the government finds it extremely difficult politically to modify downwards wages and salaries paid to these workers. Therefore, wages and salaries of civil servants and other public sector workers are very rigid in the public sector budget.

Seventh, although they are not directly part of the public budget structure, some rigidities are implicit in the fiscal policy in the form of tax incentives (tax exemptions) with the goal of encouraging specific sectors of the economy. Tax exemptions are normally treated in the expenditure side of the public budget as tax expenditure. Although in Ghana tax expenditure (or tax exemptions when appearing in the revenue side of the budget) has attracted intensive policy discussions since at least 2007 with the goal of controlling its growth, the government has not achieved any significant success.

2.3 The Effects of Fiscal Rigidities: A Theoretical Overview

Although some fiscal rigidities in the public budget may be justifiable and even desirable, a large number of fiscal rigidities constituting a big chunk of public spending is problematic. Echeverry, Bonilla and Moya (2006), for instance, argue that when faced with a significant number of budget inflexibilities, the argument that budget inflexibilities may be a desirable phenomenon in the light of certain regulatory criteria loses power and encounters several objections. They point out, for example, that it is possible that some of the inflexible sectors are not an actual priority, and that their inclusion in the budget results from the entrapment of income by interest groups.

Clearly, the immediate effect of fiscal rigidities is that the government loses control over fiscal policy to the extent of the size of the fiscal rigidity. This makes the government become incapacitated when the need to use fiscal policy to address fiscal and macroeconomic challenges arises. Simply put, the government loses fiscal discretion and thus fiscal policy maneuverability in the presence of fiscal rigidities. Consequently, the following effects occur when fiscal rigidities constitute a large portion of the public budget.

i. **Inability to Create Significant Fiscal Space without Resorting to Borrowing:** Substantial amounts of public investment, particularly in infrastructure, are vital for economic growth and development. This is especially true for developing countries where there are huge infrastructure gaps. However, high levels of fiscal rigidities make it very difficult for the government to create the needed fiscal space to significantly expand public investment without resorting to borrowing. The reason is that two easy and less problematic ways to create fiscal space are cutting lower priority spending and increasing revenues. However, if the public budget, including the lower priority spending, is highly rigid, it becomes difficult for the government to cut spending in any significant manner. Also, revenue enhancement policies lose their ability to generate significant fiscal space if the rigidities also take the form of revenue earmarking, since increases in revenue generate automatic spending. This may therefore force governments to rely on borrowing as the only major means of creating additional fiscal space to expand public investment. Yet, borrowing does not only increase budgetary expenditure, which can lead to higher levels of fiscal deficits at least in the short to medium term because of debt service expenditure, it compounds the rigidity problem, since debt service expenditure itself is a type of fiscal rigidity, as we saw earlier. In fact, in the presence of high levels of fiscal rigidities, borrowing may stimulate further borrowing because of the additional contraction of the fiscal space due to debt service expenditure, which may ultimately result in excessive levels of debt buildups and thus fiscal distress.

ii. **Ineffectiveness in Managing Fiscal Crises:** The presence of fiscal rigidities makes the government less effective in managing fiscal crises. The reason is that to achieve effective management of fiscal crises, there is the need for the government to ensure strong fiscal adjustment or consolidation in the form of significant expenditure cuts and/or revenue enhancement. However, as we pointed out under the previous point, when there are high levels of fiscal rigidities, it becomes difficult for the government to significantly cut spending. At the same time, revenue enhancement policies lose their adjustment power when the rigidities also take the form of revenue earmarking, since, again, increases in revenue generate automatic spending.

iii. **Quality of Fiscal Adjustment Reduces:** Fiscal rigidities also reduce the quality of fiscal adjustments. The reason is that capital expenditure cuts usually become the major means of fiscal adjustment, which poses challenges for economic growth and employment. Also, in times of economic difficulties, rigidities in the public budget make it difficult to reallocate resources towards social safety nets.

iv. **Lower Incentives to Improve Efficiency in Spending:** Fiscal rigidities have been found to lower incentives to improve efficiency in public spending, since resources are guaranteed irrespective of performance. For instance, assessing efficiency as a benchmark to guide expenditure rationalization in Slovenia, Mattina and Gunnarsson (2007) argue that the efficiency of public spending depends on maintaining sufficient budgetary flexibility so that the expenditure rationalization can better target inefficient spending.

v. **Misallocation of Resources:** Fiscal rigidities can bring about misallocation of resources because they tend to lead to overspending in some sectors while other sectors, however productive they may be, may be left underfunded.

vi. **Procyclical Government Spending:** Fiscal rigidities make government spending procyclical. The reason is that fiscal rigidities (particularly revenue earmarking) force the government to spend extra fiscal income during expansions and cut it back during recessions. Also, the government's loss of fiscal discretion because of fiscal rigidities includes its loss of ability to carry out discretionary countercyclical spending when the need for such spending arises. Therefore, the presence of a high degree of fiscal rigidity does not only make economic crises take a longer time to recover from, they also hit the people very hard.

3.0 The Behavior of Rigid Expenditures in Ghana from 1993 to 2015

We discuss in this section the behavior of rigid expenditures in Ghana from 1993 to 2015. This will help us to understand the degree and the dynamics of the various types of rigidities in the country's budget during the period. In doing this, we also discuss the factors and policy choices that have influenced the size and the dynamics of the rigid expenditures.

From the 7 reasons for the occurrence of fiscal rigidities discussed in Subsection 2.2, we can categorize fiscal rigidities into four budgetary expenditures: Earmarked Expenditure, Wages and Salaries, Debt Service Expenditure and Tax Expenditure. Although in Ghana, following standard practice, tax expenditure is recorded as an expenditure item, an equivalent amount is recorded on the revenue side of the budget as tax exemptions, making it have no net impact on the budget. Also, before 2007, tax expenditure (and thus tax exemptions) was not accounted for in the fiscal table. Because of this, data on tax expenditure (and tax exemptions) before 2007 are unavailable. Additionally, beginning with the 2016 budget the government has again taken away tax expenditure as a direct budget line, treating it as a mere memorandum item. Perhaps the government sees tax expenditure and tax exemptions as fictitious expenditure and revenue items. For these reasons, we have excluded tax expenditure as a fiscal rigidity in this study. Therefore, we have also excluded tax exemptions from total revenue.

3.1 Earmarked Expenditure

As we stated in our paper on revenue earmarking, which was mentioned in the introduction, there are currently 11 active earmarking arrangements in Ghana with one more (the Tertiary Education Research Fund) in the pipeline. However, because the data used for the analysis cover the period 1993-2015, transfers to the Ghana Infrastructure Investment Fund (GIIF), which were budgeted to begin in 2016, cannot naturally form part of the analysis. Earmarked expenditure (total[1]) in this study therefore covers data on 10 earmarked (or statutory) payments: Retirement Benefits[2] (RB), District Assemblies Common Fund (DACF), Road Fund (RF), Ghana Education Trust Fund (GETF), Petroleum Related Funds (PRF), National Health Insurance Fund (NHIF), Retention of Internally Generated Funds (RIGF), Ghana Stabilization Fund (GSF), Ghana Heritage Fund (GHF), and earmarked Transfers to the Ghana National Petroleum Corporation (TGNPC).

[1] *For the behavior of some individual earmarked transfers from 1993 to 2015, see our paper Revenue Earmarking in Ghana: Management and Performance Issues (IFS Occasional Paper No. 7, 2016). Also, note that total earmarked expenditure in each year includes current payments of earmarked expenditure arrears. However, because of limited disaggregation of arrears payment in the fiscal table, there are some earmarked expenditure arrears payment we might have excluded because of lack of identification.*

[2] *Retirement Benefits (RB) as used here include government statutory (earmarked) transfers to the Social Security Fund on behalf of its workers as well as its pension and gratuity payments.*

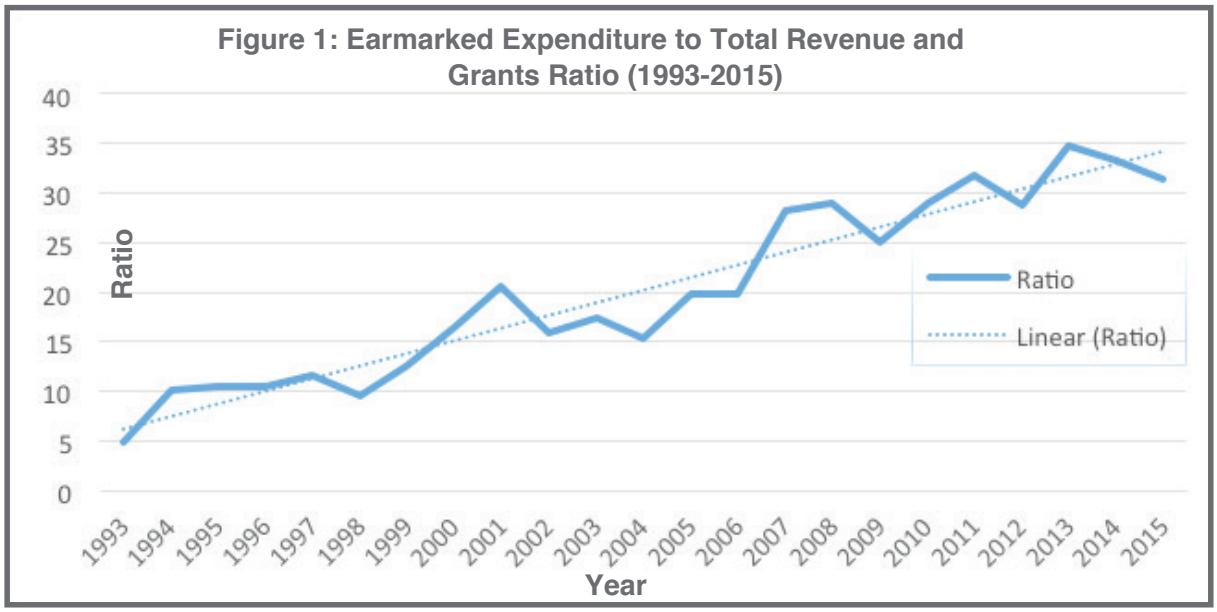
It is important to point out that the Petroleum Revenue Management Act gives the Minister of Finance the power to cap transfers to the Ghana Stabilization Fund and requires the amount above the cap to be transferred into the newly established Contingency Fund and Sinking Fund for debt repayment. Therefore, transfers to the Contingency Fund and the Sinking Fund, which began in 2014, are also included in the earmarked expenditure.

Earmarked expenditure saw sharp increases during the sample period 1993-2015, which significantly contributed to rigidities in the country's annual budgets. This is depicted in Table 1. We can see from the table that in nominal terms, total earmarked expenditure increased sharply from GH¢3.7 million in 1993 to GH¢89.0 million in 2000, and to GH¢1,206.9 million in 2007. By the end of 2015, total earmarked expenditure had reached a whopping GH¢9,415.4 million.

Table 1: Earmarked Expenditure and Its Revenue Ratio from 1993 to 2015

Year	Number of Earm Expenditures in the Budget at the time	Total Earm. Expenditure (GH¢'000,000)	Total Earm. Exp. to Total Rev. and Grants Ratio (%)	Period Average (%)
1993	1	3.7	4.9	4.9
1994	2	11.7	10.0	10.7
1995	2	19.3	10.4	
1996	2	23.9	10.4	
1997	2	30.4	11.5	
1998	2	33.8	9.5	
1999	2	46.3	12.5	
2000	4	89.0	16.5	16.5
2001	5	174.7	20.6	17.3
2002	5	180.1	15.9	
2003	5	294.0	17.4	
2004	5	365.6	15.3	
2005	6	558.6	19.8	19.8
2006	6	629.8	19.7	
2007	7	1,206.9	28.2	27.8
2008	7	1,488.0	28.9	
2009	7	1,643.4	25.0	
2010	7	2,431.2	28.9	
2011	10	3,902.3	31.8	32.0
2012	10	4,573.7	28.8	
2013	10	6,461.7	34.7	
2014	10	7,842.1	33.3	
2015	10	9,415.4	31.4	

Source: Government of Ghana (2012)



It is not unexpected that increases in revenue resulting from economic expansion will induce increases in total earmarked expenditure, since, by definition, earmarked expenditure is linked to revenue. However, we can see from column 4 of Table 1 that even after taking away the effect of increases in total revenue and grants (TR&G), total earmarked expenditure still saw sharp increases. Total earmarked expenditure as a ratio of total revenue and grants (excluding tax exemptions), which stood at only 4.9% in 1993, increased to 16.5% in 2000 and to 28.2% in 2007. Indeed, total earmarked expenditure as a ratio of total revenue and grants increased to 34.7% in 2013 before declining to 31.4% in 2015. Figure 1, which depicts this information graphically, clearly shows that total earmarked expenditure as a ratio of total revenue and grants has seen quite a steep rising trend since 1993.

What is responsible for the sharp increases in earmarked expenditure even after taking away the effect of revenue increases? As one would expect, the cause is the continuous increase in the number of earmarked funds[3] Column 5 of Table 1 demonstrates this. With only one earmarked fund in the budget in 1993, earmarked expenditure covered only 4.9% of total revenue and grants. However, as the number increased to 2 from 1994 to 1999, the ratio increased to 10.7% on average. Similarly, as the number of earmarked expenditures increased to 4 in 2000 and 5 in 2001-2006, average earmarked expenditure as a ratio of total revenue and grants increased to 16.5% and 17.3% respectively. In fact, this relationship remained unbroken throughout, and therefore as the number of earmarked expenditures in the budget reached 10 in 2011-2015, earmarked expenditure absorbed 32.0% of total revenue and grants on average.

3.2 Wages and Salaries

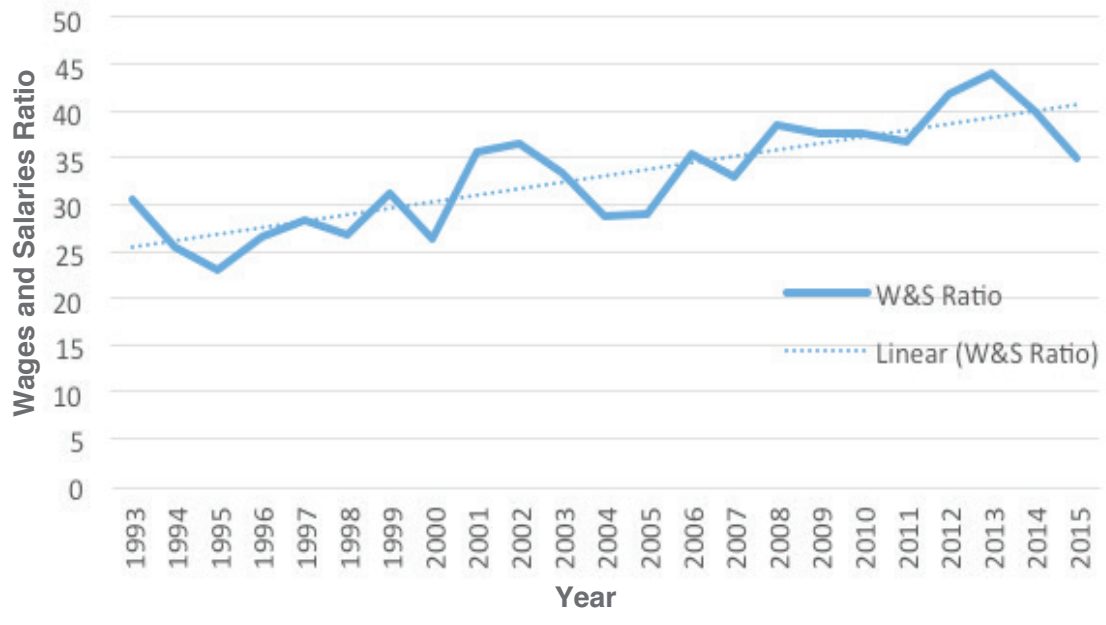
In nominal terms, wages and salaries saw sharp increases from 1993 to 2015 (see Table 2). Wages and salaries increased from GH¢22.76 million in 1993 to GH¢142.28 million in 2000 and to GH¢3,182.53 million in 2010. By the end of 2015, expenditure on wages and salaries had increased sharply to GH¢10,555.93 million.

[3] *Although Road Fund had been in existence since 1985, it was in 2000 that it was recorded as a separate line in the fiscal account table. Therefore, Road Fund is treated as if it began in 2000. This is the reason why Table 1 has only 1 earmarked expenditure item (Retirement Benefits) in 1993.*

Table 2: Wages and Salaries and its Revenue Ratio, 1993-2015

Year	Total Earm. Expenditure (GH¢'000,000)	Wages and Salaries to TR&G Ratio (%)	Period Average (%)
1993	22.76	30.6	26.5
1994	29.71	25.6	
1995	43.10	23.1	
1996	61.26	26.8	
1997	75.06	28.5	28.3
1998	95.68	26.9	
1999	116.11	31.3	
2000	142.28	26.4	
2001	303.65	35.8	33.8
2002	414.18	36.7	
2003	566.10	33.6	
2004	694.67	29.0	
2005	824.35	29.2	34.2
2006	1,137.05	35.6	
2007	1,418.78	33.2	
2008	1,987.64	38.6	
2009	2,478.69	37.8	38.6
2010	3,182.53	37.8	
2011	4,534.87	36.9	
2012	6,665.52	41.9	
2013	8,242.94	44.2	39.9
2014	9,448.57	40.2	
2015	10,555.93	35.2	

Figure 2: Wages and Salaries to Total Revenue and Grants Ratio (1993-2015)



One could argue that this is not surprising, as increases in revenue resulting from inflation and economic growth naturally lead to increases in most budgetary expenditure items like wages and salaries. What is therefore more interesting are the dynamics of wages and salaries after the effects of revenue increases have been isolated.

Indeed, expenditure on wages and salaries as a ratio of total revenue and grants saw a rising trend from 1993 to 2015. This is depicted by the third column of Table 2 as well as Figure 2. The last column of Table 2 sheds further light on this point. This column presents period averages of wages and salaries as a ratio of total revenue and grants. We can see from this column that, on average, every new period (corresponding to the political cycles) since 1993 is associated with higher wages and salaries as a ratio of total revenue and grants. Specifically, standing at 26.5% in 1993-1996, average expenditure on wages and salaries as a ratio of total revenue and grants increased to 28.3% in 1997-2000, and to 33.8% in 2001-2004. In fact, average expenditure on wages and salaries as a ratio of total revenue and grants continued to increase, reaching 39.9% in 2013-2015. This implies that public sector workers in Ghana have been receiving an increasing share of public revenues since 1993. Put differently, expenditure on wages and salaries has been growing faster than revenues accruing to the government since 1993. Given that revenue growth is largely explained by the general economic expansion, this further implies that since 1993, public sector workers as a group continue to be paid more than what the general expansion in the economy dictates in proportionate terms.

What explains this phenomenon? Is it because the size of public sector employment has been growing faster than the general expansion in the economy and thus the labor force? This is not the case. The explanation is that public sector employment as a ratio of the labor force has seen a declining trend over the years. According to the Ghana Living Standard Surveys, public sector employment as a ratio of the total labor force declined from 7.8% in 1991/1992 to 5.9% in 1998/1999 and to 5.7% in 2012/2013. Taking into consideration the fiscal challenges Ghana has faced over the years, the correct explanation for the continuous increase in the share of total revenue and grants paid to public sector workers as wages and salaries is that electoral realities have rendered Government of Ghana weak in the face of workers' agitations. Thus, the government has been yielding easily to workers' wages and salaries demands,[4] which has resulted in wages and salaries increasing faster than the rate of increase in total revenue and grants.

3.3 Debt Service Expenditure

Interest payment exceeded amortization during the entire period from 1993 to 2015 (see Table 3). Also, these two components of debt service expenditure moved along the same direction from 1993 to 2008. However, while interest payment as a ratio of total revenue and grants generally saw a sharp rising trend starting from 2008, amortization as a ratio of total revenue and grants did not only stay relatively low but also declined for the most part starting from 2009. Therefore, the gap between

[4] *This is not to say that Ghanaian public sector workers are overpaid. Assessing whether Ghanaian public sector workers are overpaid or underpaid requires a careful cross-sectional analysis of public sector wages and salaries in Ghana and its peers. It is, however, noteworthy that according to data from the IMF, while Ghana paid 5.5% of GDP as public sector wages and salaries in 1998, the average for sub-Saharan Africa stood at 6.7% in the same year. However, wages and salaries as a ratio of GDP grew so fast in Ghana that by the end of 2003, it had increased by 3.1 percentage points to 8.9%, while the average for sub-Saharan Africa had only increased by 1 percentage point to 7.7% in 2003. Still, countries like Burkina Faso, Ethiopia, Kenya, Namibia, Sierra Leone, Zambia and Zimbabwe paid higher ratios of wages and salaries to GDP than Ghana in 2003.*

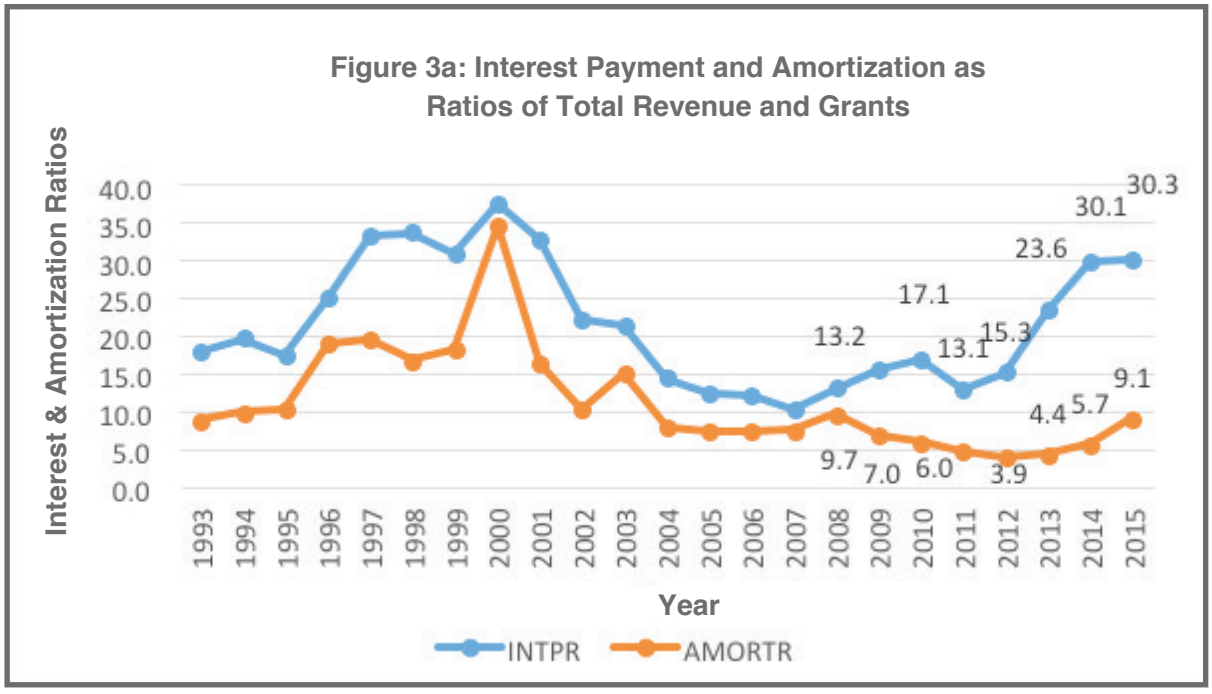
interest payment and amortization as ratios of total revenue and grants widened starting from 2009. Columns 2 and 3 of Table 3 and Figure 3a depict these behaviors. The question that arises here is, as ratios of total revenue and grants, why did amortization stay low relative to interest payment starting from 2009, thereby widening the gap between these two components of debt service expenditure? The answer is that since 2007/2008 there has been a relative shift from bilateral and multilateral borrowing, whose servicing requires simultaneous interest and principal payments (amortization), to commercial borrowing (particularly Eurobonds), which requires only yearly interest payment with a bullet payment of the whole principal amount at maturity dates. Therefore, the low ratios of amortization to total revenue and grants starting from 2009 is far from being good news for Ghana, but rather it is a signal that serious debt servicing problems await the country upon the maturity of the various Eurobonds, as large chunks of amortization payments have merely been postponed to begin in 2017.

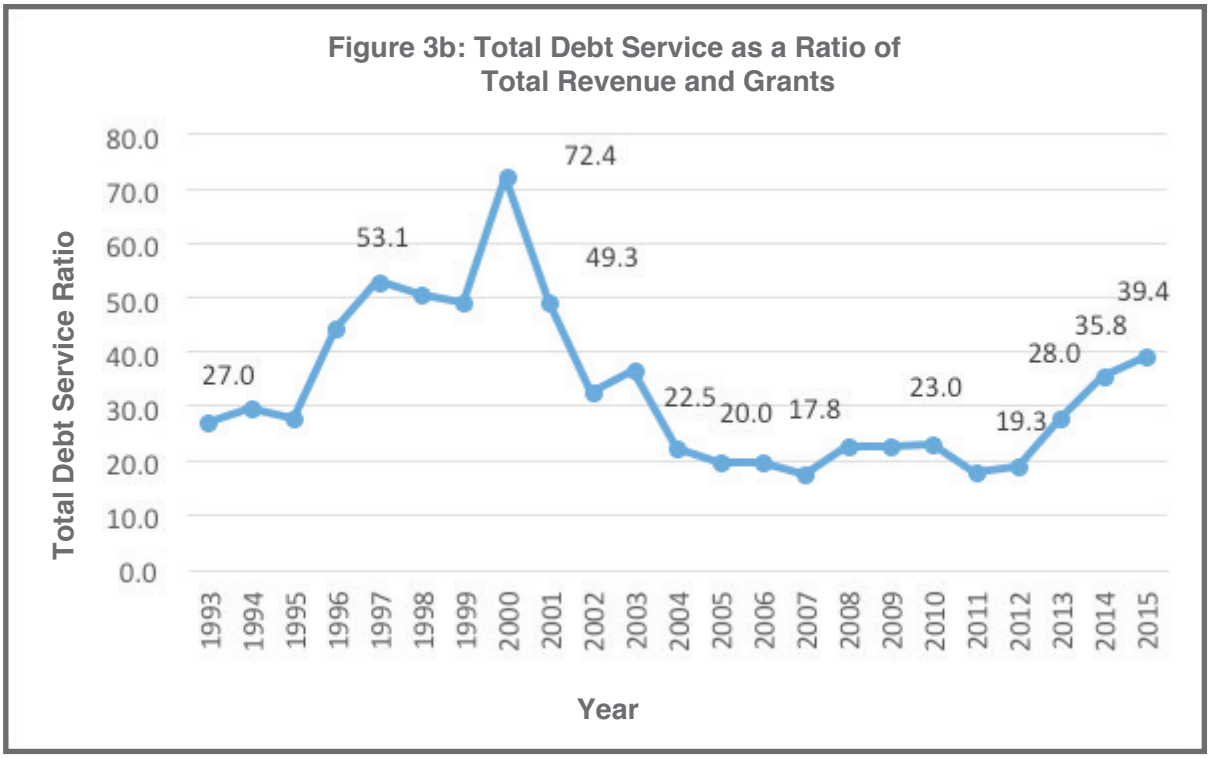
The behavior of total debt service expenditure as a ratio of total revenue and grants from 1993 to 2015 can be classified into four different periods: period of ascent, 1993-2000; period of descent, 2001-2004; period of bottoming-out, 2005-2012; and period of re-ascent, 2013-2015. During the period of ascent, expenditure on total debt service as a ratio of total revenue and grants saw a sharp

Table 3: Debt Service Expenditures and their Revenue Ratios, 1993-2015

Year	Interest Payment		Amortization		Total Debt Service Exp.	
	GH¢'000,000	% of TR&G	GH¢'000,000	% of TR&G	GH¢'000,000	% of TR&G
1993	13.48	18.1	6.61	8.9	20.08	27.0
1994	23.05	19.9	11.50	9.9	34.54	29.8
1995	32.88	17.6	19.42	10.4	52.30	28.0
1996	57.93	25.3	43.71	19.1	101.64	44.4
1997	88.52	33.6	51.60	19.6	140.12	53.1
1998	120.35	33.9	59.90	16.9	180.25	50.8
1999	115.02	31.0	68.06	18.3	183.07	49.4
2000	203.34	37.8	186.75	34.7	390.09	72.4
2001	278.72	32.9	139.02	16.4	417.74	49.3
2002	253.21	22.4	116.03	10.3	369.24	32.7
2003	363.34	21.5	255.93	15.2	619.28	36.7
2004	347.24	14.5	192.02	8.0	539.25	22.5
2005	354.05	12.5	209.83	7.4	563.87	20.0
2006	393.37	12.3	235.13	7.4	628.50	19.7
2007	440.01	10.3	321.22	7.5	761.23	17.8
2008	679.18	13.2	497.41	9.7	1,176.59	22.9
2009	1032.32	15.7	457.71	7.0	1,490.04	22.7
2010	1439.36	17.1	502.31	6.0	1,941.67	23.0
2011	1611.18	13.1	584.28	4.8	2,195.46	17.9
2012	2436.15	15.3	623.60	3.9	3,059.76	19.3
2013	4396.97	23.6	821.41	4.4	5,218.38	28.0
2014	7080.87	30.1	1330.94	5.7	8,411.81	35.8
2015	9075.34	30.3	2734.09	9.1	11,809.43	39.4

increasing trend. Standing at 27.0% in 1993, debt service expenditure as a ratio of total revenue and grants increased to 53.1% in 1997 and further to as high as 72.4% in 2000. Thus, in 2000 the country spent as high as 72.4% of its total revenue and grants to service its debt alone. The high and increasing debt service burden during 1993-2000 was caused by the large increases in the country's indebtedness both domestically and externally during the period.





On the domestic front, the financing of the high levels of fiscal deficits the country had experienced, especially starting from 1992, led to the large levels of domestic debt buildups, which substantially contributed to the debt service burden. The foreign debt buildups resulted from the large inflows of foreign capital from the IMF and World Bank as well as bilateral sources to finance the much-touted liberalization and market reform programs Ghana was pursuing under the auspices of these multilateral institutions. Thus, the consequence of Ghana earning the praise as the 'Star of Africa' in terms of the success of the liberalization and market reform programs and the pumping of billions of dollars into the Ghanaian economy by the external actors over the years, starting from 1983, was the huge accumulated external debt, which contributed significantly to the sharp increases in debt service expenditure during 1993-2000.

During the period of descent, debt service expenditure sharply declined, reaching 22.5% in 2004. This was due to the HIPC initiative the government opted for in 2001. Now, after reaching the HIPC completion point in 2004, debt service expenditure as a ratio of total revenue and grants bottomed-out, ranging between only 17.8% and 23.0% from 2005 to 2012. However, starting from 2013, debt service expenditure as a ratio of total revenue and grants began to re-ascend, increasing to 28.0% in 2013, 35.8% in 2014 and reaching 39.4% in 2015. Indeed, the ratio recorded in 2015 was the highest since 2001. As one would expect, the increasing nature of debt service expenditure since 2013 reflects the rapid debt buildups the country has witnessed since 2013. Total public debt as a ratio of GDP, which stood at 47.3% in December 2012, increased to 56.6% in December 2013 and further to 69.7% in December 2014. By the end of December 2015, total public debt as a ratio of GDP had increased to 71.6%.

4.0 The Effects of Fiscal Rigidities in Ghana[5]

Having understood how the three rigid expenditure items have behaved and what have influenced their behaviors since 1993, we consider in this section the practical effects of total rigid expenditure (the sum of these three rigid expenditure items) in Ghana.

4.1 Total Rigid Expenditure, Revenue Limit and the Effect on the 'Free' Fiscal Space and Fiscal Policy Maneuverability in Ghana

We stated in Subsection 2.3 that the immediate effect of large levels of fiscal rigidities is that the government loses discretion and flexibility over fiscal policy, which makes the government unable to easily respond to changing fiscal and macroeconomic circumstances. We understood that this happens because fiscal rigidities consume the fiscal space. We demonstrate here the extent of this phenomenon in Ghana since 1993. To do this, we consider the behavior of the sum of the three rigid expenditure items (i.e. total rigid expenditure (TRE)) in relation to total revenue and grants (TR&G) since 1993. This will enable us to have a clear picture about the degree of absorption of total revenue and grants by fiscal rigidities in Ghana, thereby helping us to identify the size of the government's

[5] *For a formal estimation of fiscal and macroeconomic effects of fiscal rigidities in Ghana using regression analysis, see Appendix B.*

available 'free' fiscal space[6], which determines the degree of fiscal policy discretion/maneuverability the government has before it decides to borrow. It is important to emphasize here that since, by definition, the government does not have control over rigid expenditures, at least in the short term, we measure the level of the government's free fiscal space by the ratio by which total revenue and grants exceeds total rigid expenditure.

Columns 2 and 3 of Table 4 present the nominal values of total revenue and grants and total rigid expenditure respectively.

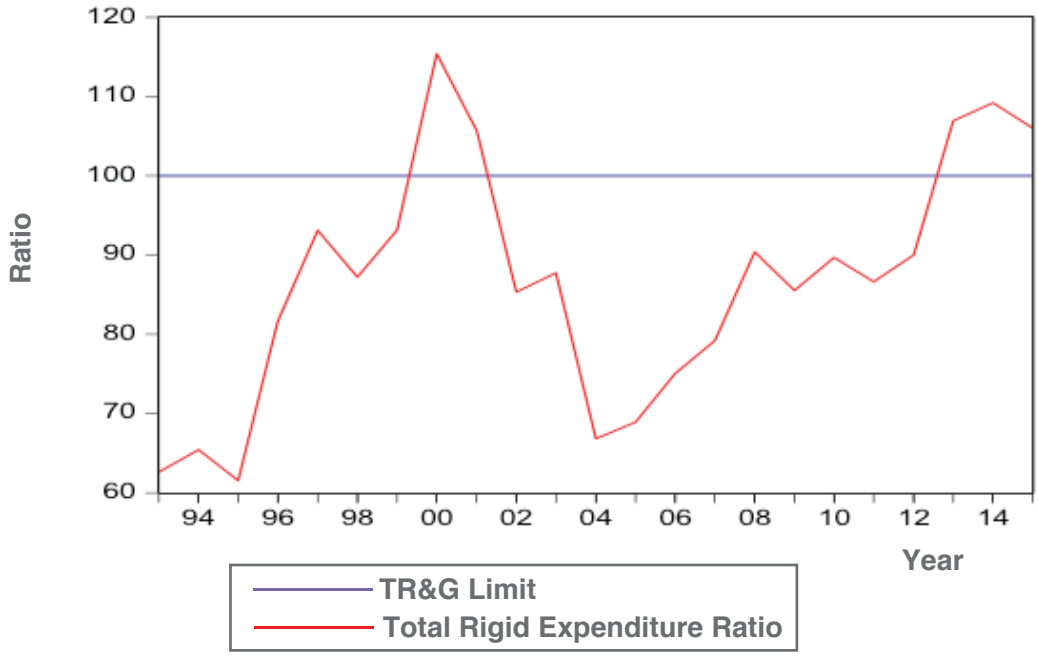
Table 4: Total Rigid Expenditure (TRE), Total Revenue and Grants (TR&G) and the Free Fiscal Space

Year	TR&G (GH¢'000,000)	TRE (GH¢'000,000)	Revenue Limit (%)	TRE as Ratio of TR&G (%)	TRE as Ratio of TR&G (%)
1993	74.28	46.50	100	62.6	37.4
1994	116.02	75.91	100	65.4	34.6
1995	186.47	114.70	100	61.5	38.5
1996	228.86	186.80	100	81.6	18.4
1997	263.75	245.57	100	93.1	6.9
1998	355.16	309.76	100	87.2	12.8
1999	370.89	345.49	100	93.2	6.8
2000	538.50	621.41	100	115.4	-15.4
2001	847.69	896.14	100	105.7	-5.7
2002	1,129.14	963.47	100	85.3	14.7
2003	1,686.16	1,479.39	100	87.7	12.3
2004	2,393.84	1,599.53	100	66.8	33.2
2005	2,825.64	1,946.78	100	68.9	31.1
2006	3,191.77	2,395.39	100	75.0	25.0
2007	4,277.51	3,386.96	100	79.2	20.8
2008	5,147.50	4,652.22	100	90.4	9.6
2009	6,562.80	5,612.08	100	85.5	14.5
2010	8,424.43	7,555.41	100	89.7	10.3
2011	12,273.44	10,632.68	100	86.6	13.4
2012	15,889.49	14,298.97	100	90.0	10.0
2013	18,629.55	19,923.06	100	106.9	-6.9
2014	23,527.78	25,702.44	100	109.2	-9.2
2015	29,981.76	31,780.73	100	106.0	-6.0

While comparing the data in these two columns is useful, let us dwell more on the last three columns of the table, which are also graphically shown by Figure 4. Column 5 of the table presents total rigid expenditure as a ratio of total revenue and grants.

[6] Fiscal space refers to a government's available room for fiscal maneuver (Ostry, 2010). We qualify our measure of fiscal space as free because, as was pointed out in Subsection 2.3, governments usually try to increase the level of fiscal space beyond what we measure here by borrowing additional amounts at a cost. Indeed, fiscal space is created by cutting spending, increasing revenue, or borrowing (Peter S. Heller, 2005), but our measure of fiscal space ignores the borrowing component, hence the qualification 'free.'

Figure 4: Total Rigid Expenditure In Total Revenue and Grant Space (in Ratios)



The revenue limit shown in the fourth column of the table represents the ratio of available revenues to the government in any given year. It is calculated by dividing total revenue and grants by itself and multiplying it by 100. In figure 4, this is represented by the blue horizontal line. Therefore, the space below this line can be called total revenue and grants space. If total rigid expenditure as a ratio of total revenue and grants is below the revenue limit, then the government has extra revenue (or free fiscal space) to spend on other expenditure items at its discretion. In the last column of Table 4, these are shown as positive ratios. However, if total rigid expenditure as a ratio of total revenue and grants is above the revenue limit, then the ratio above the limit represents the proportion of total rigid expenditure that total revenue and grants is unable to cover. In the last column of Table 4, these are shown as negative ratios. Thus, they indicate that in that particular year, not only does the government have no free fiscal space, it has to borrow money to the tune of the excess ratio before it can meet its rigid expenditures. Therefore, the national budget is in deficit even before the government begins to spend money on other expenditure items such as goods and services, public investment, etc.

In 1993, the government of Ghana had 37.4% extra revenue above the amount needed to cover total rigid expenditure (or had 37.4% free fiscal space). However, this ratio continued to shrink, reaching only 6.8% in 1999. In fact, in 2000, total rigid expenditure alone exceeded total revenue and grants by as much as 15.4%, implying that the government had -15.4% free fiscal space. Thus, the government had to borrow to the tune of 15.4% of its total revenue and grants before it could meet total rigid expenditure alone. The sharp increase in total rigid expenditure as a ratio of total revenue and grants from 1993 to 2000 was caused by increases in all the three rigid expenditure ratios. However, debt service expenditure was the biggest driver.

Starting from 2001 total rigid expenditure as a ratio of total revenue and grants began to decrease. In 2001, although total revenue and grants was insufficient to fully cover total rigid expenditure, the negative difference reduced to 5.7% of total revenue and grants.

Starting from 2002, however, the excess revenue ratio assumed positive values. In fact, by the end of 2004 total revenue and grants had exceeded total rigid expenditure to the extent that the government had 33.2% of total revenue and grants as free fiscal space.

What was the main driver behind the sharp reduction in total rigid expenditure as a ratio of total revenue and grants, causing the free fiscal space to sharply increase? The main driver here was debt service expenditure. Debt service expenditure as a ratio of total revenue and grants reduced from 72.4% in 2000 to only 22.5% in 2004 due to the HIPC debt reliefs, as we pointed out earlier.

Starting from 2005, total rigid expenditure as a ratio of total revenue and grants began to increase. Therefore, the free fiscal space or the extra revenue ratio started to decrease, reaching 9.6% in 2008 before picking up to 14.5% in 2009. It however began to decline again starting from 2010, reaching 10.0% in 2012. This time around, debt service expenditure ratio was not the main driver behind the increase in the total rigid expenditure ratio and thus the decrease in the free fiscal space. Indeed, debt service expenditure ratio continued to stay low, ranging from 17.8% to 23% from 2005 to 2012. Wages and salaries ratio, which significantly increased in response to workers' agitations, and the earmarked expenditure ratio, which also significantly increased due to the increase in the number of earmarked funds, were the drivers.

Sadly, beginning in 2013 the huge fiscal entanglement in which the government of Ghana found itself in 2000 and 2001, which caused the country to swallow its pride and opt for the HIPC initiative in 2001, has re-emerged – total rigid expenditure alone has exceeded total revenue and grants once again. The ratio by which total revenue and grants has fallen short of total rigid expenditure stood at -6.9% in 2013, -9.0% in 2014 and -6.0 in 2015. Thus, since 2013, the government has had negative free fiscal space yearly. Consequently, starting from 2013, the government has had no choice but to borrow, not only to finance other expenditure items like public investment, but also to be able to meet its rigid expenditure obligations. It is important to point out that this time around, all the three rigid expenditure items are to be blamed. Thus, in addition to the regular earmarked expenditure and wages and salaries ratios further increasing on average, debt service expenditure ratio, which generally stayed low from 2005 to 2012, saw sharp increases starting from 2013. As we pointed out earlier, the sharp increase in the debt service expenditure ratio reflects the high rate of debt buildups starting from 2013.

4.2 The Effects on Fiscal Consolidation in Ghana

Since 1993, fiscal consolidation, which is defined in the OECD Glossary of Statistical Terms as a policy aimed at reducing government deficit and debt accumulation, has always been among the key policy objectives pursued by the government. Thus, from the Enhanced Structural Adjustment Facility (ESAF) supported programs that the government implemented in the 1990s, through the Poverty Reduction Strategies (GPRS I & II) implemented in the 2000s, to the present Ghana Shared Growth and Development Agendas (GSGDA I & II) as well as the Extended Credit Facility Supported Program under the IMF, reducing the fiscal deficit and debt accumulation has been a key government policy priority. The question that arises here is, how have fiscal rigidities affected the country's fiscal consolidation efforts over the years?

4.2.1 The Effect on the Fiscal Deficit in Ghana

The government's success in reducing the fiscal deficit in Ghana has largely depended upon the degree of rigidity in the budget. In fact, the higher the degree of fiscal rigidity, as measured by the size of total rigid expenditure ratio, the lower the tendency for the fiscal consolidation efforts of the government to succeed and thus the higher the size of the fiscal deficit, and vice versa. The explanation for this is that when total rigid expenditure ratio is high, making the available free fiscal space small, the government is unable to significantly cut spending, thereby making the fiscal deficit remain high despite the government's pursuit of a fiscal consolidation policy. Also, since an increasing portion of revenue in Ghana is earmarked, as we saw in Subsection 3.1, revenue increases have lost a great deal of their deficit reduction power due to the automatic trigger of spending, as has been pointed out before. Table 5 demonstrates the effect of total rigid expenditure as a ratio of total revenue and grants on the fiscal deficit to GDP ratio.

Table 5: The Effect of Fiscal Rigidities on the Fiscal Deficit

Period	Average Total Rigid Expenditure as a Ratio of TR&G (%) (RIGIDR)	Average Overall Fiscal Deficit to GDP Ratio (%) (DEFICITR)	Correlation Co-efficient
1993-1996	67.8	5.9	0.72
1997-2000	97.2	8.5	
2001-2004	86.4	4.1	
2005-2008	78.4	4.6	
2009-2012	88.0	7.0	
2013-2015	107.0	8.9	

Note: Starting from 2006, the rebased GDP figures were used to generate the deficit ratios.

We can see from Table 5 that when average total rigid expenditure as a ratio of total revenue and grants increased from 67.8% in 1993-1996 to 97.2% in 1997-2000, the average fiscal deficit to GDP ratio also increased from 5.9% in 1993-1996 to 8.5% in 1999-2000. And when average total rigid expenditure ratio declined to 86.4% in 2001-2004 and 78.4% in 2005-2008 due to the HIPC debt reliefs which substantially reduced the debt service expenditure component, the average overall fiscal deficit followed suit, decreasing to 4.1% of GDP in 2001-2004 and 4.6% of GDP in 2005-2008. Also, when average total rigid expenditure as a ratio of total revenue and grants began to increase again starting from 2009-2012, average overall fiscal deficit ratio also began to increase starting from the same period. Interestingly, as total rigid expenditure as a ratio of total revenue and grants registered its highest average value of 107% in 2013-2015, due mostly to the sharp rise in debt service expenditure, so also did the overall fiscal deficit to GDP ratio register its highest average value of 8.9% during this period.

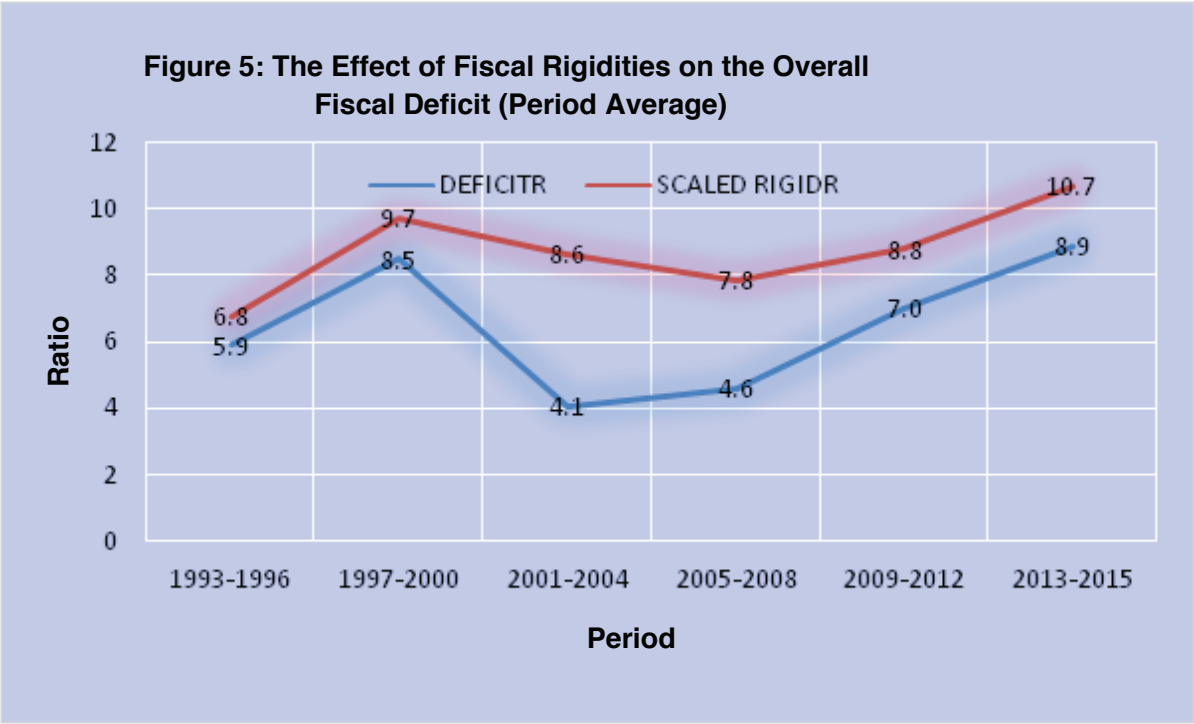


Figure 5 also depicts how closely the overall deficit to GDP ratio (DEFICITR) has followed the movement of total rigid expenditure to total revenue and grants ratio (RIGIGR). It should, however, be pointed out that total rigid expenditure ratios (RIGIGR) in Figure 5 have been scaled down by a factor of 10 so as to enable us to depict the two variables in the same plane with greater clarity. Though the scaling down has artificially reduced the values of the total rigid expenditure ratio in the figure, it has not affected its behavior or the direction of its movement.

As shown in the last column of Table 5, the correlation co-efficient between the two variables stands at 0.72, which shows quite a strong relationship. Based on the theoretical discussion, we assert that this relationship is a causal one.

4.2.2 The Effect on Debt Accumulation in Ghana

It is widely understood that debt accumulation is directly impacted by the overall fiscal deficit a country declares. Therefore, the high rates of debt accumulation often recorded in Ghana are directly explained by the usually large overall fiscal deficits the country records, which are in turn influenced by the degree of fiscal rigidity, as we just saw above. This implies that a more fundamental factor behind the usually high rates of debt accumulation in Ghana is the high degree of rigidity often present in the country's budget. It is, however, important for us to remember that through debt service expenditure, debt accumulation itself is a source of fiscal rigidity. Therefore, there is a reverse causality between debt accumulation and fiscal rigidities, with the fiscal deficit serving as the medium. The implication is that debt accumulation feeds on itself, particularly when there is an initial high degree of rigidity in the budget. This is because the existence of significant levels of fiscal rigidity leads to high fiscal deficits, which lead to large levels of debt accumulation, resulting in greater levels of debt service expenditure and thus higher levels of fiscal rigidities, and the cycle continues. Without resorting to painful and extraordinary measures, this cycle is difficult to break.

The exponential rates of debt buildups in Ghana in the 1990s, pushing total debt to GDP ratio to increase to 185.2% by the end of 2000, which caused the country to opt for the HIPC Initiative in 2001, and the present high rate of debt buildups since 2013 attest to how debt can quickly feed on itself and begin to ring alarming bells. In each of these periods, there was a high and sharply-rising total rigid expenditure providing the impetus for the debt explosion.

4.2.3 The Effect on the Quality of Fiscal Consolidation in Ghana

As we pointed out in Subsection 2.3, fiscal rigidities reduce the quality of fiscal consolidation. The reason, again, is that in its pursuit of fiscal consolidation policies, the government largely resorts to cutting domestically-financed capital expenditure, since it is unable to cut rigid expenditures. This affects economic growth and employment generation. Therefore, the higher the total rigid expenditure, the lower the domestically financed capital expenditure, and vice versa when the government is in pursuit of fiscal consolidation policies.

Data show that this negative relationship between fiscal rigidities and domestic capital expenditure strongly holds in Ghana. We can see from Table 6 that for every period since 1993, increase in total rigid expenditure as a ratio of total revenue and grants has resulted in decrease in domestic capital expenditure[7] to GDP ratio in Ghana. Also, except in 2001-2004, decrease in total rigid expenditure to total revenue and grants ratio has always resulted in increase in domestic capital expenditure to GDP ratio. It is interesting to note that with the lowest average total rigid expenditure ratio of 67.8% registered in 1993-1996, domestically-financed capital expenditure to GDP ratio was the highest at 5.3% of GDP during that period. Also, when total rigid expenditure ratio attained its highest average value of 107.0% in 2013-2015, domestically-financed capital expenditure to GDP ratio registered its lowest ratio of 1.3% during the same period. The correlation coefficient between these two variables is -0.78, as shown in the last column of Table 6.

Table 6: The Effect of Fiscal Rigidities on the Size of Domestic Capital Expenditure to GDP Ratio in Ghana

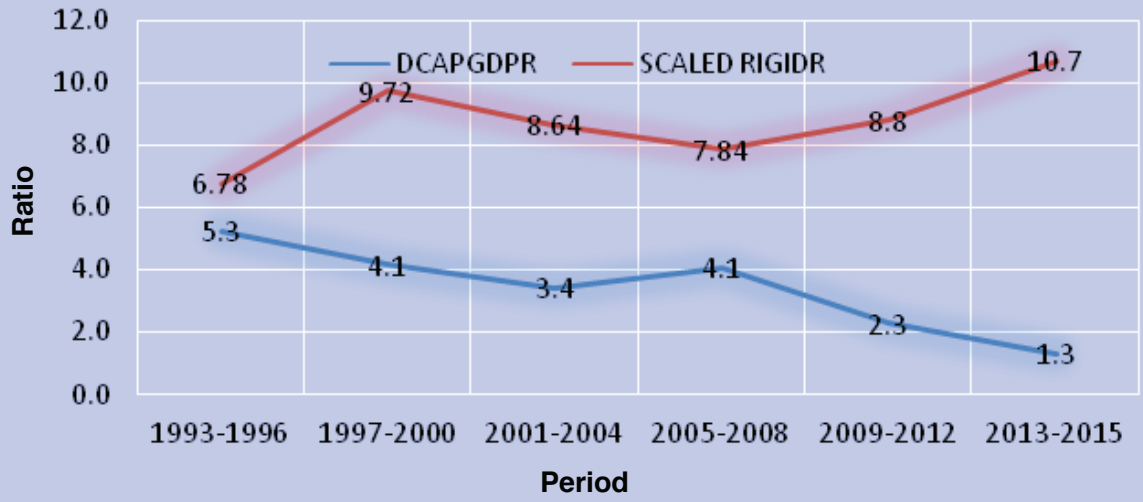
Period	Average Total Rigid Expenditure as a Ratio of TR&G (RIGIDR) (%)	Domestic Capital Expenditure to GDP Ratio (DCAPGDPR) (%)	Correlation Co-efficient
1993-1996	67.8		0.78
1997-2000	97.2		
2001-2004	86.4		
2005-2008	78.4		
2009-2012	88.0		
2013-2015	107.0		

Note: Starting from 2006, the rebased GDP figures were used to generate the DCAPGDPR.

[7] *It important to point out that part of earmarked expenditure is capital expenditure. However, this has not historically been disaggregated to be included in the domestic capital expenditure in the national budget. Following suit, the domestic capital expenditure here represents the domestic capital expenditure line in the national budget.*

Figure 6 graphically depicts the negative relationship between total rigid expenditure as a ratio of total revenue and grants (RIGIDR) and domestically-financed capital expenditure to GDP ratio (DCAPGDPR). Again, RIGIDR has been scaled down by a constant factor of 10 to enable us to get a nicer fit for the two variables using the same scales without affecting its behavior and curvature. This figure clearly depicts a strong negative relationship between RIGIDR AND DCAP-GDPR. Again, based on the theoretical analysis, we argue that this relationship is a causal one.

Figure 6: The Effect of Fiscal Rigidities on Domestic Public Investment in the Face of Fiscal Consolidation Policy



4.3 The Effects of Fiscal Rigidities on Macroeconomic Stability[8] and Real GDP Growth in Ghana

As we saw in the previous section, a high degree of fiscal rigidity leads to high levels of fiscal deficit, and vice versa. Also, as shown by a number of studies (see, for instance, Ghartey, 2001 and Boakye, 2009), high levels of fiscal deficit have been a major driving force behind macroeconomic instability in Ghana. Therefore, fiscal rigidity is a more fundamental cause of macroeconomic instability in Ghana. Fiscal rigidity affects real GDP growth in Ghana through at least two channels. First, the macroeconomic instability resulting from fiscal rigidities dampens real GDP growth, since businesses withhold their investments in unstable macroeconomic environments. Second, the decline in public investment that emerges during the implementation of fiscal consolidation policies due to the presence of a high level of fiscal rigidity depresses real GDP growth.

Table 7 and Figures 7a to 7c depict the effects of fiscal rigidities on macroeconomic in/stability variables and real GDP growth rate in Ghana.

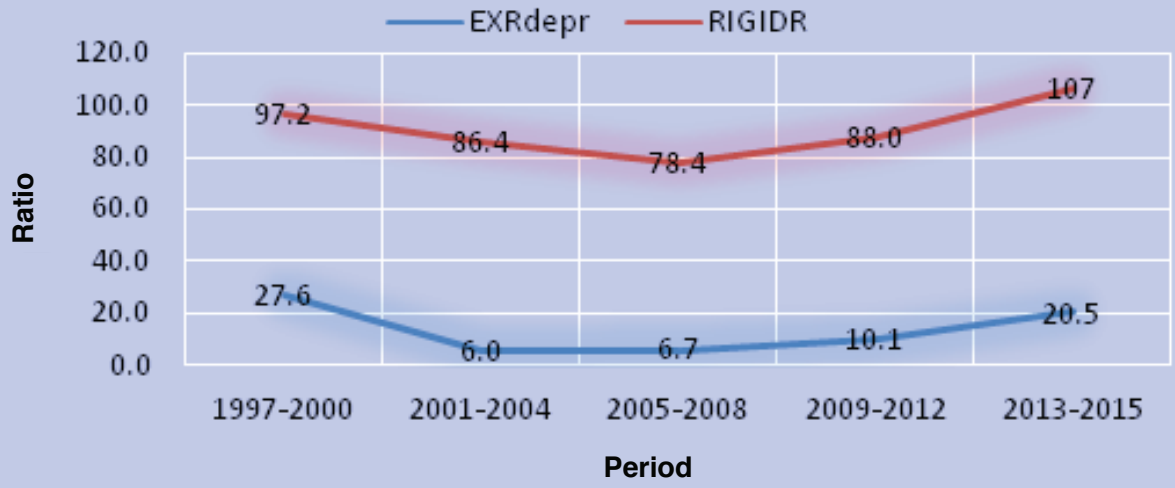
[8] *It is important to point out that the response of macroeconomic variables (particularly the response of inflation rate) to fiscal outcomes during 1993-1996 is a statistical outlier. This point is illustrated in Appendix A (dwelling on the behavior of inflation rate). Because of this, in demonstrating the effects of fiscal rigidities on the macroeconomic variables, we have omitted data for 1993-1996.*

We use the depreciation rate of the cedi against the US dollar and inflation rate (INF Rate) as the representative macroeconomic in/stability variables. Also, due to the exogenous jump in real GDP growth rate in 2011 resulting from the start of oil production in that year and thus causing a significant structural break, we use non-oil real GDP growth rate for the analysis.

Table 7: Effect of Fiscal Rigidities on Macroeconomic In/Stability and Real GDP Growth

Period	Average RIGIDR (%)	Average GH¢/US$ Dep. Rate (%)	Average INF Rate (%)	Average Non-Oil Real GDP GR (%)
1997-2000	97.2	27.6	22.6	4.2
2001-2004	86.4	6.0	21.5	4.9
2005-2008	78.4	6.7	13.9	6.4
2009-2012	88.0	10.1	10.5	7.3
2013-2015	107.0	20.5	16.1	4.9
Correlation Co-efficient (with RIGIDR)		0.79	0.26	-0.57

Figure 7a: The Effect of Fiscal Rigidities (RIGIDR) on the Deprec. rate of the Cedi against the US$ (EXRdepr)



We can see from Table 7 and Figures 7a and 7b that generally, decrease in total rigidity ratio (RIGIDR) brings about decrease in depreciation rate of the cedi against the US dollar as well as inflation rate, while increase in RIGIDR brings about increase in these variables. The correlation co-efficient between total rigid expenditure ratio and the depreciation rate of the cedi against the US dollar stands as high as 0.79, while that between rigidity ratio and inflation rate stands at only 0.26. This implies that in Ghana the exchange rate of the cedi is more responsive to fiscal outcomes than inflation rate. This is not surprising given that to a large extent inflation rate in Ghana is influenced by supply-side factors like food supply that mostly depends on weather conditions.

Figure 7b: The Effect of Fiscal Rigidities (RIGIDR) on Inflation Rate

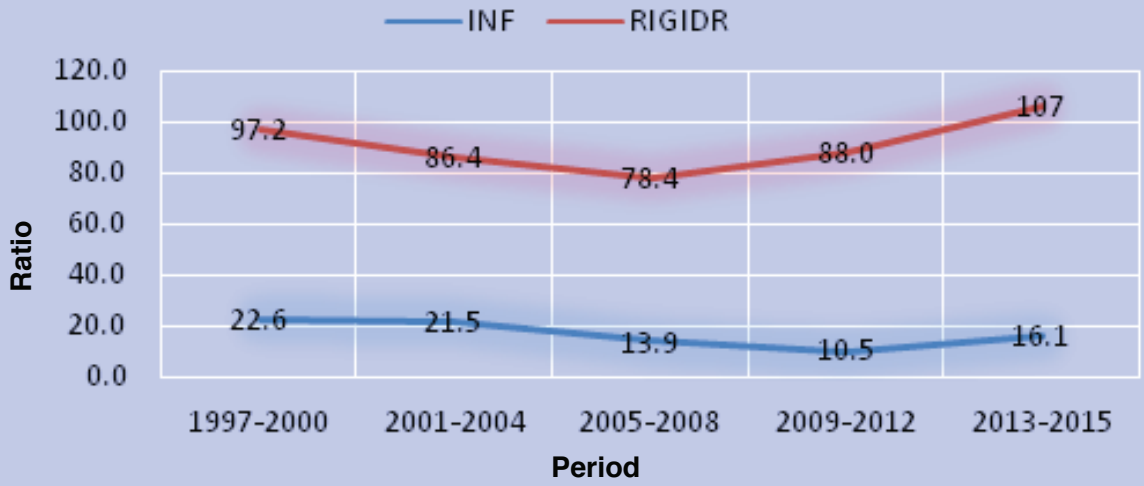
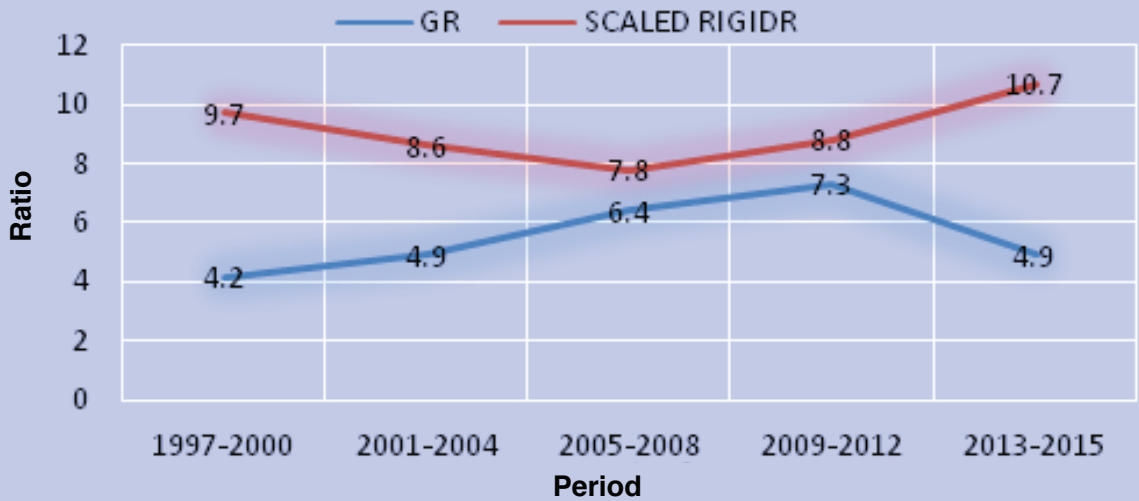


Figure 7c: The Effect of Fiscal Rigidities (RIGIDR) on Real GDP Growth Rate (GR)



From the last column of Table 7 and Figure 7c, we can see that generally, growth rate of real GDP (non-oil) is inversely related to total rigidity. The correlation co-efficient between these two variables is -0.57.

5.0 Policy Recommendations

There is no doubt that starting from 2013 Ghana has faced enormous fiscal and macroeconomic challenges, as real GDP growth has seen a drastic decline, fiscal deficits have been exceptionally high,the rate of debt buildups has sharply increased, and the macroeconomic environment has been very unstable. Based on the findings in Section 4, we can reasonably argue that the fiscal and macroeconomic difficulties the country is currently going through can be explained, to a large extent, by the sharp jump in the degree of fiscal rigidity, driven by all the three components. Indeed, when the country was in a similar situation in 2000/2001, it was rescued by debt reliefs the government gained through opting for the HIPC and MDRI initiatives. Because the HIPC and MDRI options are currently unavailable, the country would have to swallow bitter policy pills. To fully succeed, the people have to be made fully aware of the enormity of the challenges the country is facing. Making the people fully aware of the enormity of the challenges will prepare their minds for the difficult choices ahead. It is also important for the government to demonstrate by its actions that unhealthy but politically expedient choices will be avoided.

In more specific terms, the excessive rigidities in the national budget in terms of earmarked expenditure, wages and salaries, and debt service expenditure that have been found to be the underlying cause of the enormous fiscal challenge the country is facing should be urgently addressed.

With regard to earmarking, the recommendations we provided in our previous paper on the management and performance issues of revenue earmarking in Ghana (IFS Occasional Paper No. 7) become even more urgent. To recap, we recommended in that paper that the government should, as a matter of national policy, put an end to the establishment of new earmarked funds except they are clearly found to be essential. However, considering our current findings that total rigid expenditure ratio has been exceptionally high starting from 2013, mimicking the pre-HIPC levels, which is inflicting serious fiscal and macroeconomic damage to the country, we go beyond this recommendation by adding that the government should completely refrain from establishing new earmarked funds, at least until the country has been able to significantly reduce the total rigid expenditure ratio below the revenue limit.

After all, the government does not have to establish an earmarked fund before it can successfully implement important new programs. We further recommended in the said paper that the existing earmarked funds should be reviewed by a committee set up by the government with the goal of closing down the relatively nonessential ones and the monies involved redirected through the general budgetary process. Of course, closing down an earmarked fund does not necessarily mean that the program that was being funded by the fund would be terminated. What the government would gain by doing so is fiscal flexibility so that the fiscal difficulties in which the country finds itself could be addressed with some ease. The review should also aim at cutting, where necessary, parts of the earmarked revenues and returning them to the general budget in order to gain additional level of flexibility to help address the enormous fiscal challenge. It was emphasized that if the government does not improve the transparency with which it operates and thus manages the country's fiscal affairs, it will find it difficult to get the people to be on board for the closure of some of these funds, even if clear evidence exists that nothing will be lost if they are incorporated into the general budgetary process. For those funds that cannot be closed down, efficiency in management should be achieved, since, as we saw in the aforementioned paper on earmarking, most of these funds are managed inefficiently.

Political interference and inefficiencies that are undermining the usefulness of the funds should be eliminated. Though some earmarked funds like the National Health Insurance Fund (NHIF) have been established largely as social intervention initiatives, they should be managed with long-term sustainability in mind.
Based on our current understanding that the degree of fiscal rigidity has been excessively high since 2013, we add here that politicians must stop using the establishment of earmarked funds as a campaign tool. The government should also bear in mind that by establishing these funds and earmarking a portion of the national revenues to them, it has delegated parts of its functions to the funds' managers. Therefore, the government should refrain from the current practice whereby it seeks to perform the same functions it has delegated to the funds' managers, as if transfers to the earmarked funds are mere statutory obligations that do not form part of the government's programs. Indeed, this behavior leads to duplication of functions, which complicates the fiscal challenge.

While it makes sense for wages and salaries paid to public sector workers to grow in response to increase in government revenue resulting from the general economic growth, the current trajectory whereby public sector workers continue to be paid greater and greater share of government revenue is not sustainable, especially given that the size of public sector employment relative to the labor force is declining. The government should ensure that the rate of increase in wages and salaries of public sector workers does not exceed revenue growth. The government should also conduct a thorough review of public sector employment in order to right-size the public sector by getting rid of redundant workers. This will not only minimize the expenditure on wages and salaries and thus minimize the rigidities in the budget, but it will also increase productivity in the public sector. Public sector recruitment and the payroll system should also be effectively managed. While the efforts being made to remove 'ghost' names from the payroll systems are commendable, the government should ensure that 'ghost' names do not enter into the payroll system in the first place by constantly auditing the system.

The country is clearly caught in a debt trap. Because total rigid expenditure has already exceeded total revenue and grants, the government can only run the country in the normal mode[9] by borrowing. Yet, borrowing and thus adding to the public debt brings about further increase in the debt service expenditure, thereby increasing further total rigid expenditure and thus the negative free fiscal space, which requires even more borrowing, and the cycle continues. The high and increasing nature of government borrowing since 2013 and the resultant astronomical rate of public debt buildups, leading to increases in expenditure on debt service and thus the degree of fiscal rigidity, bear testimony to this argument. To help reverse this negative cycle and thus have some fiscal breathing space, the government should, at least in the short term, stop running the country's fiscal affairs in the normal mode. It is understandable that debt service expenditure is too rigid to meaningfully reduce, since even debt refinancing may not change much in the debt service equation. Therefore, in addition to checking the growth in earmarked expenditure and wages and salaries as recommended above, discretionary expenditures should be drastically cut. This should be done in such a way that growth is not negatively affected. Thus, the cuts should be more on, say, goods and services than on investment expenditure. A complete moratorium on borrowing may not be feasible in the short term given that total rigid expenditure currently exceeds total revenue and grants. However, efforts should be made to significantly reduce borrowing by directing it to finance only the most essential expenditure items. In fact, all non-essential discretionary expenditures in the budget should be eliminated.

[9] *By normal mode we mean government expenditures following their normal trends.*

An additional source of solution to the fiscal difficulty is the adoption of measures to increase the pace of revenue growth. Increased pace of revenue growth, other things remaining constant, has the potential to bring the fiscal situation to normalcy, as it could improve the excess revenue ratio with the possibility of turning it from negative into positive. However, while pursuing revenue enhancement policies, care should be exercised in order not to unnecessarily discourage the private sector and thus further undermine the already dampened economic growth. Also, given that growth in the earmarked expenditure is linked to revenue growth, revenue growth that is not matched by deliberate efforts to change the growth patterns of earmarked expenditure may not be sufficient to get the country out of the present fiscal and macroeconomic predicament. Indeed, the expected increase in oil revenue (mostly from the new wells) starting from 2017 provides some hope. However, it should be borne in mind that crude oil price on the international market is still weak. Additionally, the government does not have control over the quantity of oil production, as it depends on the profit maximization/loss minimization decisions of the foreign oil companies.

6.0 Conclusion

We studied in this paper the behavior and the effects of fiscal rigidities (earmarked expenditure, wages and salaries, and debt service expenditure) in Ghana.

Earmarked expenditure absorbed only a small portion of total revenue and grants in 1993. However, the continuous increase in the number of earmarked funds has caused it to absorb quite a large portion of total revenue presently. Wages and salaries as a ratio of total revenue and grants has also had an upward rising trend since 1993, implying that public sector workers continue to be paid higher and higher proportion of revenues to the government. This is because the government has easily been yielding to public sector workers' wage and salary agitations for political and electoral reasons. From 1993 to 2000, debt service expenditure saw a sharp rising trend in response to the fast rate of debt accumulation during the period. However, owing to government's opting for the HIPC Initiative in 2001, which resulted in a considerable amount of debt reliefs, debt service expenditure ratio saw a substantial decline from 2001 to 2004. From 2005 to 2012, debt service expenditure ratio bottomed out. However, starting from 2013, debt service expenditure ratio has been rising again at a fast rate due to the massive debt buildup resulting from the government's excessive borrowing.

Absorbing 62.6% of total revenue and grants in 1993, total rigid expenditure continued to increase, and by the end of 2000, it did not only absorb the entire total revenue and grants, it exceeded total revenue and grants by as much as 15.4%. Nevertheless, due to the debt reliefs that came with the HIPC initiative starting from 2001 and the MDRI initiative starting from 2006, which considerably reduced debt service expenditure as pointed out above, total rigid expenditure as a ratio of total revenue and grants significantly fell. However, starting from 2013 total rigid expenditure has again exceeded total revenue and grants. This implies that, like in the pre-HIPC year of 2000, the government is currently forced to borrow, not only to be able to cover other expenditure items, but also to be able to meet all its rigid expenditure obligations.

We found that high degree of fiscal rigidity has been a significant cause of the high rates of fiscal deficit and debt accumulation in Ghana. Additionally, we found that high degree of fiscal rigidity negatively affects the level of public investment in Ghana. Thus in periods of high fiscal rigidities,capital expenditure to GDP ratio has been low, and vice versa.

Furthermore, we found that high degree of fiscal rigidities has been a fundamental factor behind macroeconomic instability in Ghana. And because of this instability as well as the negative effect on public investment, high degree of fiscal rigidity negatively affects economic growth in Ghana.

Therefore, to be able to solve the fiscal and macroeconomic challenges in which Ghana currently finds itself, the government should find ways to reduce the sizes of the three rigid expenditure items, however difficult it may be. In this regard, the government should refrain from establishing new earmarked funds. The existing ones should also be reviewed with the objective of closing down those that are not essential. The government should ensure that growth rate of wages and salaries is reduced, making sure that it does not exceed the rate of revenue growth anymore. Also, the rate of borrowing should drastically reduce to minimize the rate of debt buildups. Discretionary expenditures should also be cut in order to significantly reduce borrowing and debt buildups that are compounding the problem. The government has to also supplement expenditure-cutting measures by finding ways to grow revenue without unnecessarily discouraging the private sector, which can further undermine the growth of the economy. All these imply that the government cannot continue to handle its fiscal business as usual.

7. 0 Appendices

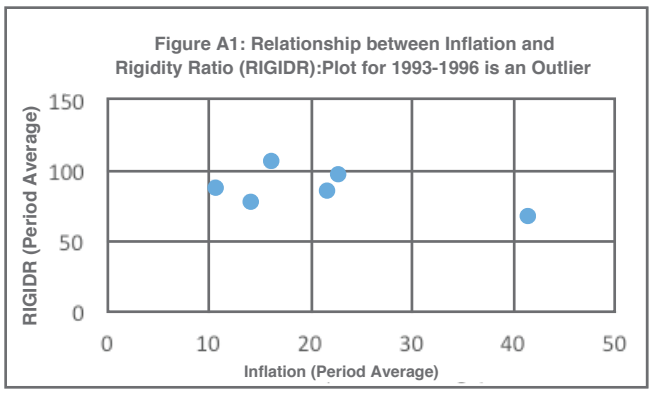
Appendix A

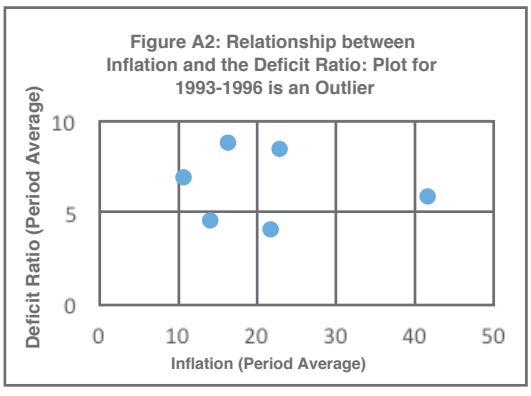
We show in this appendix that the response of the macroeconomy to fiscal outcomes during 1993-1996 is a statistical outlier, which made us drop 1993-1996 when we were discussing the effect of fiscal rigidities on macroeconomic in/stability and economic growth in Subsection 4.3. Although the responses of most macroeconomic variables to the fiscal outcomes point to the outlier nature of 1993-1996, the response of inflation rate during the period stands out. We therefore illustrate this point using inflation rate response. It should first be remembered that statistical outliers are data points that are far removed and numerically distant from the rest of the points, which make most statistical moments become abnormal.

Table A1 as well as Figures A1 and A2 demonstrate this point. The figures present scatter plots of rigidity ratio (RIGIDR) vs. inflation rate (Figure A1), and the overall fiscal deficit ratio vs. inflation rate (Figure A2). The plots to the far right in both figures are matchings for 1993-1996. Clearly, these are statistical outliers.

Table A1: Demonstrating that 1993-1996 is a Statistical Outlier with Respect to the Response of the Macro economy to Fiscal Outcomes.

Period	Average RIGIDR (%)	Average RIGIDR (%)	Average RIGIDR (%)
1993-1996	67.8	5.9	41.4
1997-2000	97.2	8.5	22.6
2001-2004	86.4	4.1	21.5
2005-2008	78.4	4.6	13.9
2009-2012	88.0	7.0	10.5
2013-2015	107.0	8.9	16.1





Appendix B

We estimate in this appendix fiscal and macroeconomic effects of fiscal rigidities using linear regression analysis. On the fiscal side, we seek to estimate the effect of total rigid expenditure (RIGIDR) on the deficit to GDP ratio (DEFICITR) and domestic capital expenditure to GDP ratio

(DCAPR). As we understood in Section 4, increase in RIGIDR is expected to lead to increase in DEFICITR but decrease in DCAPR, and vice versa. On the macroeconomic front, we seek to estimate the effect of total fiscal rigidity on real GDP growth rate and macroeconomic in/stability. Specifically, I seek to estimate the effect of RIGIDR on non-oil real GDP growth rate (GRnoil), the exchange rate of the cedi against the US dollar (EXR) and inflation rate (INFR). Here, it is expected that increase in RIGIDR will lead to increase in (worsen) macroeconomic instability and decrease in non-oil real GDP growth rate. To be able to interpret changes in the exchange rate in proportionate terms, EXR has been transformed into logarithms and named as LEXR.

Unit Root Tests

To be able to determine the appropriate estimation procedure to use, we first find out the time series properties of the data by determining the order of integration of the series using unit root tests. The reason for this is that if the series are found to be non-stationary with the order of integration greater than or equal to 1, then ordinary least square (OLS) estimation approach and its traditional modifications can lead to spurious regression with inconsistent parameter estimates (Granger and Newbold, 1974).

I use augmented Dickey-Fuller (ADF) unit root testing procedure to determine the order of integration of the series using the following equation:

$$\Delta x_t = c + b\tau + \gamma x_{t-1} + \sum_{j=1}\Psi\Delta x_{t-j} + \varepsilon_t \qquad (1)$$

Where Δ is difference operator, x_t is the variable concerned, c is a constant drift term, τ is linear time trend, j is the lag level, $\square_t$ is random error term and b, γ and Ψ are parameters to be estimated. The null hypothesis H_0: $\gamma = 1$ (the series in question has unit root and is thus non-stationary) is tested against the alternative hypothesis H_a: $\gamma < 1$ (the series is stationary). Given that the data ranges from 1993 to 2015, and that a drift term and a time trend are included in the ADF equation, computed ADF test statistics are compared with the critical value of -3.63 at the standard 5% significance level. The ADF test is a one-sided test. If the computed ADF statistic falls below the critical value, then we fail to reject the alternative hypothesis that the series is stationary, and vice versa. The first half of Table B1 presents the computed ADF test statistics and the associated p-values. We can see that with the exception of inflation rate (INF), the computed ADF test statistics of the variables fall above the critical value. We therefore reject the alternative hypothesis that these series are stationary. Thus, according to the ADF test, inflation rate is the only stationary series.

To show that the non-stationary series have unit roots or are I(1) (i.e. integrated of order 1), I test for the presence of non-stationarity in the first differences of the variables. Here, the linear time trend is excluded since differencing removes the time trend. However, a constant drift term is maintained. With this modification in the ADF equation, the critical value becomes -3.01. The second half of Table B1 presents the computed ADF test statistics for the first differences of the series and the associated p-values. It is clear that all the ADF test statistics fall below the critical value of -3.01. We therefore fail to reject the alternative hypothesis that the first differences of the series are stationary.

To sum it, while INF is integrated of order 0 and is thus stationary, the rest of the variables have unit roots (or are integrated of order 1) and are thus nonstationary.

Table B1: Augmented Dickey Fuller Unit Root Test Statistics and P-values

Variable	Test in Levels		Test in First Differences	
	ADF Statistic	P-value	ADF Statistic	P-values
RIGIDR	-2.01	0.5633	-4.34	0.0030
DEFICITR	-2.77	0.2227	-5.90	0.0001
DCAPR	-3.25	0.1004	-5.92	0.0001
GRnoil	-3.55	0.0583	-8.17	0.0000
LEXR	-1.90	0.6205	-3.48	0.0191
INF	-3.88	0.0309	-	-
Critical Value	**-3.63**		**-3.01**	

Given that inflation rate is the only I(0) variable here, we exclude it from our estimation models[10]. This means that we represent macroeconomic in/stability by only the exchange rate of the cedi against the US dollar. Therefore, the variables for the fiscal estimation model are (DEFICITR DCAPR RIGIDR) and those for the macroeconomic estimation model are (GRnoil LEXR RIGIDR).

The Estimation Model and Methodology

As argued earlier, non-stationarity makes the application of traditional estimation methodologies yield spurious regression with non-consistent parameter estimates. The t-statistics of such regressions diverge at the rate of $\sqrt{T}$, making it difficult for the problem to be detected using t-statistics.

However, if linear combinations of a vector of I(1) variables yield stationary error terms, then the variables in question are said to be co-integrated, which can be estimated to yield consistent coefficients. In more formal terms, A vector of I(1) variables y_t is co-integrated if there exists a vector β_i such that $\beta_i' y_t$ is trend stationary. If there exist r linearly independent vectors β_i, i = 1, …,r, then y_t is co-integrated with co-integrating rank r, and the matrix $\beta = (\beta_1, \ldots.\beta_r)$ is the cointegration matrix. β'yt is an r-dimensional vector of trend-stationary variables.

It is clear from the above definition that before we estimate the effects of RIGDIDR on the other variables in each of the two sectors (fiscal and macroeconomic), a co-integration test is needed for us to ascertain the co-integrating rank r (i.e. the number of linearly independent vectors/equations).

First, let each set of variables (i.e. the fiscal and macroeconomic variables) be represented by a vector autoregressive (VAR) model as follows

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \ldots\ldots\ldots + A_p y_{t-p} + \Psi D_t + \epsilon_t \qquad (2)$$

[10] *It should be pointed out that instead of completely dropping inflation rate as a variable, it would have been better to replace it by the consumer price index (CPI), which is the integrated form of inflation rate and which is most likely to be an I(1) variable. However, the base year for the computation of the CPI in Ghana has changed 4 times since 1993, making Ghana's CPI become a highly discontinuous variable during our sample period 1993- 2015, and thus not conducive for this kind of regression analysis.*

Where the vector yt = [DEFICITR DCAPR RIGIDR]' for the fiscal model and yt = [GRnoil LEXR RIGIDR]' for the macroeconomic model. Ai is therefore a 3x3 matrix of coefficients, Dt is a vector of deterministic components (constant drift term and time trend), Ψ is the coefficient matrix of the deterministic components, and ϵt is 3x1 vector of innovations (error terms). Given that all the variables in each model are I(1), model (2) can be transformed into a vector error correction model (VECM) as follows:

$$\Delta y_t = \Pi y_{t-1} + \sum_{j=1} \Gamma_j \Delta y_{t-j} + \Psi D_t + \epsilon_t \qquad (3)$$

Where $\Pi = \sum_{i=1} A_i - 1$, and $\Gamma_i = -\sum_{j=i+1} A_j$. It is important to note that the number of co-integrating vectors are equal to the number of stationary relationships. If there are no co-integration relations, all rows in the matrix Π must be zeroes. Thus, for each set of variables, if the rank (Π) = 0, then there is no co-integration relationship among the variables. On the other hand, if rank(Π) = 3 for each set, then there a full rank, implying that all the variables are stationary. We do not expect this case as the unit root tests we conducted showed that all the three variables in each group have unit roots. However, if Π has a reduced rank, implying that 0 < rank(Π) < 3, then the co-integrating vectors are given as $\Pi = \alpha\beta'$ where β_i represents the ith co-integration vector, and α_j represents the effects of each co-integrating vector on the Δy_t,p. It is important to state that in economic terms cointegration relations represent long-run or equilibrium relations.

We apply Johansen's Co-integration rank test. This test uses a system of maximum likelihood (ML) estimator for cointegration restrictions in a VAR representation as given by equation (2). We use the trace statistics for the tests. The null hypothesis (H_0) of r cointegration relations is tested against the alternative hypothesis (H_a) of k co-integrating relations. The test uses a sequential approach, starting from r = 0 to r = k-1 until we fail to reject the null hypothesis. We selected the lag lengths for the test VARs using Akaike information criterion (AIC) test statistics. Interestingly, as part of the Johansen's co-integration rank test, asymptotically efficient estimates of the cointegration regression parameters are provided.

Cointegration Testing and Estimation Results for the Fiscal Model

The AIC lag structure test for the fiscal model resulted in 1-lag length for the test VAR, implying 0 lag for the co-integration rank test. Also, given the nature of the series, a linear deterministic trend was assumed for the cointegration equation. The trace test results for the fiscal model is presented in Table B2 below. The test indicates two cointegration equations at 5% significance level.

Table B2: Trace Test Results for the Fiscal Model

Sample (adjusted): 1994 2015
Included observations: 22 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: DEFICITR DCAPR RIGIDR
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value
None *	0.653491	49.99699	42.91525
At most 1 *	0.542190	26.68039	25.87211
At most 2	0.350429	9.491753	12.51798

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The two cointegrating equations estimation results for the fiscal model are also presented in Table B3 below.

Table B3: The 2 Cointegrating Equations Estimation Results for the Fiscal Model

	Eqn 1: Deficit to GDP Ratio (DEFICITR)	Eqn 2: Domestic Capital to GDP Ratio (DCAPR
Time Trend (τ)	-0.02	-0.07***
	(0.34)	(3.9)
Total Rigidity Ratio (RIGIDR)	0.12***	-0.15**
	(4.1)	(2.0)

Notes: a) The values in parenthesis are t-statistics.
b) *** and ** indicate statistical significance at 1% and 5% significance levels respectively.
c) Appropriate signing has been applied after transferring the dependent variables to the left hand side.

In the traditional format, the estimated cointegration equations for the fiscal model are stated as follows:

Equation 1: $DEFICITR = -0.02\tau + 0.12RIGIDR$

Equation 2: $DCAPR = -0.07\tau - 0.15RIGIDR$

We can see from these equations that increase in total rigidity as a ratio of total revenue and grants (RIGIDR) does not only have an increasing effect on the deficit to GDP ratio (DEFICITR) and a decreasing effect on domestic capital expenditure to GDP ratio (DCAPR) as we theoretically postulated, these effects are statistically significant. Specifically, the results show that, all things remaining the same, a 1% increase in total rigid expenditure as a ratio of total revenue and grants leads to 0.12% increase in the deficit to GDP ratio, while the same 1% increase in the total rigid expenditure as a ratio of total revenue and grants leads to 0.15% decrease in the domestic capital to GDP ratio.

These results provide quantitative evidence to support the point we made in the main text that to achieve improved fiscal performance in Ghana, the government should ensure that fiscal rigidities are significantly reduced, since it would give the government the needed flexibility to ensure effective fiscal management.

Co-integration Testing and Estimation Results for the Macroeconomic Model

The AIC lag structure test for the macroeconomic model resulted in 4-lag length for the test VAR, implying 3 lags for the co-integration rank test. Again, a linear deterministic trend was assumed for the co-integration equation. The trace test results for the fiscal model are presented in Table B4 below. The test again indicates two co-integration equations at 5% significance level.

Table B4: Trace Test Results for the Macroeconomic Model

Sample (adjusted): 1997 2015
Included observations: 19 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: GRNOIL LEXR RIGIDR
Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.871768	67.09168	67.09168	0.0000
At most 1 *	0.659009	28.06738	28.06738	0.0262
At most 2	0.330571	7.625263	7.625263	0.2838

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table B5 presents the two cointegrating equations estimation results for the macroeconomic model.

Table B5: The 2 Cointegrating Equations Estimation Results for the Macro Model

	Eqn 1: Non-oil Real GDP Growth Rate (GRnoil)	Eqn 2: The Exchange Rate in Log. (LEXR)
Time Trend (τ)	0.32***	-0.07
	(9.9)	(1.5)
Total Rigidity Ratio (RIGIDR)	-0.08***	0.18***
	(3.7)	(5.9)

Note: a) The values in parenthesis are t-statistics.
b) *** indicates statistical significance at 1% significance levels.
c) Appropriate signs have been applied after transferring the dependent variables to the left hand side.

In the traditional format, the estimated cointegrating equations for the macroeconomic model are stated as follows:

Equation 1: $GRnoil = 0.32\tau - 0.08RIGIDR$

Equation 2: $LEXR = -0.07\tau + 0.18RIGIDR$

The estimation results for the macroeconomic model show that increase in total rigidity as a ratio of total revenue and grants (RIGIDR) does not only have a decreasing effect on non-oil real GDP growth rate, and an increasing (or a worsening) effect on macroeconomic instability represented by the exchange rate of the cedi against the US dollar as we theoretically argued, these effects are statistically significant. Specifically, a 1% increase in total rigid expenditure as a ratio of total revenue and grants brings about 0.08% decrease in non-oil real GDP growth rate in statistically significant terms, while the same 1% increase in total rigid expenditure as a ratio of total revenue and grants brings about 0.18% increase in the exchange rate of the cedi against the US dollar in statistically significant terms.

Concluding Remarks

The estimation results for the fiscal and macroeconomic models imply that if the government is able to significantly reduce the present high degree of fiscal rigidity in Ghana, the country's fiscal position will not only significantly improve, but economic growth will also be significantly enhanced while at the same time macroeconomic instability will significantly reduce.

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