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Public debt sustainability and debt dynamics

The case of Tanzania

Maureen Were¹ and Lekinyi Mollel²

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Abstract: Rising public debt in sub-Saharan Africa remains a matter of concern. We provide an analysis of public debt and debt sustainability in Tanzania, focusing on external debt. Though current and previous analyses using the IMF-World Bank debt sustainability framework indicate low risk of public external debt distress, these analyses are sensitive to exchange rate volatility and export shocks and are predicated on strong assumptions of robust future economic growth and reduced government borrowing. Moreover, empirical evidence of debt sustainability based on the fiscal reaction function approach is weak. The challenge lies in ensuring debt remains sustainable, given the need to scale up development expenditure to address infrastructure gaps amid dwindling donor financing and vulnerability to exogenous shocks, particularly in light of the COVID-19 pandemic. Rapid debt accumulation—particularly commercial debt—could expose Tanzania to external risks. Leveraging on concessional borrowing, efficient public investment, enhanced debt management, and domestic resource mobilization are critical.

Key words: public debt, Tanzania, debt sustainability, external debt

JEL classification: E60, E62, H63, H68

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¹ UNU-WIDER, Helsinki, Finland, corresponding author: were@wider.unu.edu; ² Bank of Tanzania, Dar es Salaam, Tanzania.

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Information and requests: publications@wider.unu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

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1 Introduction

The rate at which Africa's public debt has accumulated continues to attract attention regionally and internationally. According to IMF (2018a), the median level of public debt in sub-Saharan Africa (SSA) as at end of 2017 exceeded 50 per cent of gross domestic product (GDP).¹ About 40 per cent of low-income developing countries in SSA had slid into debt distress or were at high risk of debt distress.² The average level of SSA debt was about 57 per cent of GDP in 2019.

Tanzania's public debt, though rising, has not attracted much attention compared with that of other countries in the region, such as Ethiopia and Kenya. The country has generally been considered to be at low risk of debt distress (IMF 2018b). Nonetheless, the rate of debt accumulation coupled with the increase in public investment needs, including the funding of strategic infrastructure projects in the context of a relatively low tax base and dwindling donor funding, pose a challenge. In addition, it has been noted that low debt-to-GDP ratios for Tanzania are partly due to debt relief provided in the early 2000s under the frameworks of the Heavily Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI). Moreover, the changing composition of debt from concessional towards the relatively more expensive commercial debt pose a challenge of sustainability in future. Not only that, but also access to international financial markets has introduced new risks, such as vulnerability to changes in financing conditions.

Though the debt-to-GDP ratio for Tanzania seems reasonable—37.8 per cent as of June 2018—the debate about the (in)adequacy of the debt sustainability framework of the International Monetary Fund (IMF) and World Bank that is commonly used in the assessment remains a challenge. Part of the concern relates to the fact that the focus on the level of public debt as measured by debt-to-GDP ratio provides an incomplete picture and hence should not be the only or main yardstick for determining sustainability. For instance, the ratio changes when GDP level rises due to rebasing while the domestic revenue used to service the debt remains unchanged. Moreover, other variations that capture debt dynamics, such as changes in interest rates, inflation, exchange rate exposures, economic growth, and fiscal and current account deficits impact the country's debt-carrying capacity over and above the debt-to-GDP criterion. Likewise, there are other underlying financing risks, such as maturity mismatch (i.e. borrowing short term to finance large projects with long gestation periods for which little or no revenue is available to service the debt) and currency mismatch (borrowing in foreign currency while revenue streams are in local currency yet having to repay the debt in foreign currency) (Ndulu 2018). Beyond actual debt levels, debt management, the prudence of fiscal policy, the quality of public investment, and the integrity of fiscal institutions also matter.

Based on the above background and in view of rapidly rising debt accumulation, there is a need to undertake in-depth analysis of public debt in Tanzania and the implications for future sustainability of debt. The objective of this paper is to analyse public debt and debt sustainability, focusing on external debt. Besides exploratory analysis of the evolution and structure of debt, debt sustainability is examined on the basis of the recent debt sustainability analysis (DSA) undertaken by the government of Tanzania using the IMF-World Bank debt sustainability framework (DSF), complemented by empirical estimation of a fiscal reaction function, which is an approach to

¹ This is, however, still lower than the 90 per cent median debt-to-GDP ratio for African countries before the Heavily Indebted Poor Countries (HIPC)/Multilateral Debt Relief Initiative (MDRI) period.

² These include Chad, Mozambique, South Sudan, and Republic of Congo.

analysing debt sustainability commonly used in the empirical literature (Bartoletto et al. 2013; Paret 2017; Tóth 2011).

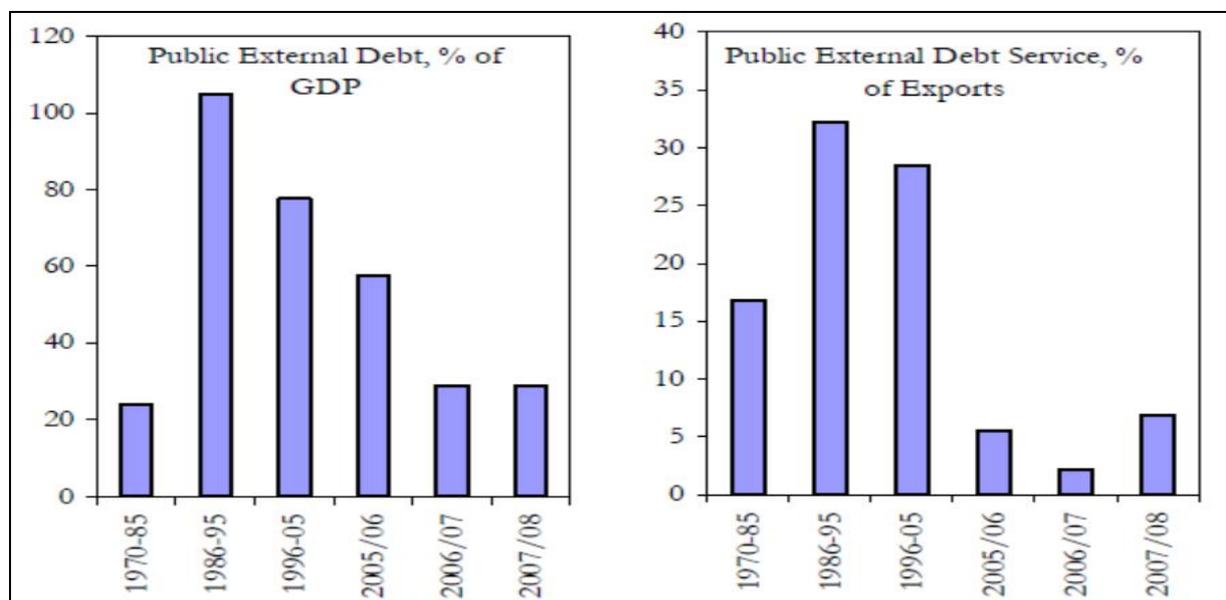
The rest of the paper is as follows: Section 2 provides a synopsis of the historical background of debt and debt relief initiatives in Tanzania, followed by an overview of recent macroeconomic indicators and the evolution of debt in Section 3. A review of empirical literature on debt sustainability is given in Section 4. Section 5 provides a discussion on the conceptual framework of debt sustainability in the context of low-income countries, while Section 6 provides an overview of debt sustainability frameworks. A discussion of the results of the DSA based on the IMF-World Bank framework and the estimation of a fiscal reaction function are discussed in Section 7. Section 8 provides conclusions and policy implications.

2 Historical background: debt and debt relief initiatives in Tanzania

Tanzania has been one of the major recipients of foreign aid and concessional loans, mostly to fund the state-owned enterprises that dominated practically all sectors of the economy after independence.³ According to Nord et al. (2009), by 1988 there were about 400 parastatals, accounting for 20 per cent of GDP. Most of the enterprises could not yield the intended results due to mismanagement and inefficiency, and instead drained the meagre domestic resources, while some plunged into heavy debt.⁴

Thus, by the mid-1980s the country was already struggling with mounting debt service (Figure 1), compounded by low export earnings and the impact of external shocks, including the oil price shocks of the 1970s and poor weather. Real GDP growth averaged 2.3 per cent during the period 1981–85. The public sector was bloated, while the domestic revenue base was limited.

Figure 1: External sustainability indicators, 1970–2007



Source: reproduced from Nord et al. (2009: 2, Figure 2), with permission.

³ These were mainly created in a bid to promote self-reliance and collective ownership of resources in the spirit of socialism as articulated in the Arusha Declaration of 1967 (Nord et al. 2009).

⁴ These and other challenges that had crippled the economy by the early 1990s are documented in former president Benjamin William Mkapa's memoir *My Life, My Purpose: A Tanzanian President Remembers* (2019).

As the economic crisis deepened, various economic reforms were initiated in the mid-1980s towards transforming the economy from state control to an open market economy. However, substantive reforms were witnessed in the early 1990s, including the liberalization of the economy and the foreign exchange market. Fiscal reforms including fiscal management to constrain government spending and tax policy reforms, such as the introduction of VAT in 1998 to mobilize domestic revenue, were also undertaken.

The economy was heavily dependent on foreign aid from development partners, especially the Nordic countries and international financial institutions. By the early 1990s, foreign aid was funding about 60 per cent of the development budget (Calderisi 2015). The public sector had also grown faster, leading to budgetary challenges. The average public external debt as percentage of GDP and public external debt service as a percentage of exports exceeded 100 per cent and 30 per cent, respectively, in the period 1986–95 (Figure 1). The debt-to-GDP ratios reached 122 per cent in 1988 and 179 per cent in 1994 (Mollel 2009). A weak revenue base, a shortage of foreign exchange especially in the period prior to economic liberalization, and the transfer of parastatal debt obligations to an already over-stretched government budget led to a build-up of external payment arrears.

The government needed reprieve from the heavy debt burden,⁵ and hence it was not surprising that Tanzania was among the first countries to get debt relief under the HIPC Initiative. This initiative was launched in 1996 by the IMF and the World Bank together with other multilateral creditors as the first comprehensive effort to address unsustainable debt in the world's most heavily indebted poor countries. In October 1999, the initiative was enhanced by increasing the number of eligible countries and raising the amount of debt relief. Tanzania reached 'decision point' in April 2000 and 'completion point' in November 2001, after implementing a raft of macroeconomic and structural reforms, including coming up with a 'Poverty Reduction Strategy Paper' (PRSP), thus becoming the fourth country to reach completion point after Bolivia, Mozambique, and Uganda.⁶ The structural reforms included a reduction of the role of the state in the economy through privatization and liberalization of the economy. By December 2000, 334 privatizations had been completed.

At the completion point, the IMF estimated that debt service relief from Tanzania's creditors under the enhanced HIPC Initiative amounted to approximately US\$3 billion over time (\$2.026 billion in net present value/NPV terms) as of 2001. As a result, the NPV of Tanzania's total external debt was reduced by about 54 per cent (IMF 2001). The NPV of the debt-to-export ratio was expected to remain well below the target ceiling of 150 per cent throughout the period 2000–20, with a further fall in debt ratios after taking into account additional bilateral assistance beyond the enhanced HIPC Initiative (IMF 2001).

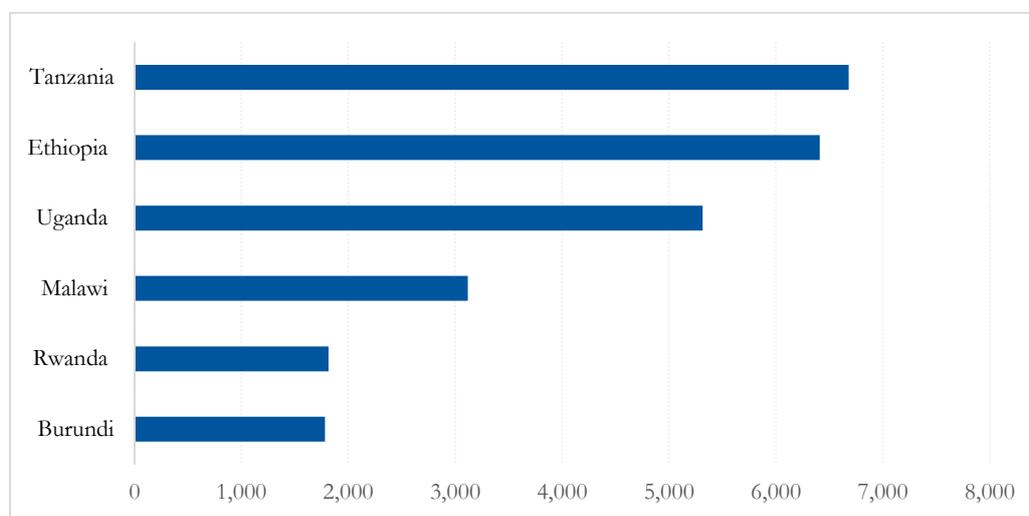
Besides the HIPC Initiative, Tanzania also benefited from the MDRI. To complement the HIPC Initiative, the MDRI was launched in June 2005 following the G8 major industrial countries' proposal for the multilateral institutions—i.e. the IMF, the International Development Association (IDA) of the World Bank, and the African Development Fund (AfDF)—to cancel 100 per cent of their eligible debt claims on countries that had reached, or would eventually reach, the HIPC

⁵ At the end of 1998, external debt which stood at US \$ 5 billion was larger than Tanzania's estimated GDP.

⁶ To qualify, eligible countries needed to demonstrate the capacity to prudently use the assistance granted by establishing a satisfactory track record under programmes supported by the IMF and the International Development Association (IDA) (decision point) and implementing a poverty reduction strategy together with a set of growth-enhancing measures (interim relief), followed by completion point—the stage at which a country became eligible for full and irrevocable debt relief.

completion point. The total committed debt relief for Tanzania from both the HIPC and the MDRI frameworks as at end of August 2018, amounting to over US\$6 billion, was comparatively higher than that of HIPC peers such as Uganda, Ethiopia, Malawi, and Rwanda (Figure 2).

Figure 2: Committed debt relief (HIPC and MDRI) as of end August 2018 (US\$ millions)



Source: authors' compilation based on IMF (2019).

The debt relief initiatives substantially alleviated Tanzania's debt burden, leading to a significant decline in debt indicators. Debt stock was reduced to below US\$5,000 million in 2006, while the ratio of debt to gross national income (GNI) and debt as a percentage of exports declined to as low as 33.6 per cent and 128.7 per cent, respectively (Kaiser et al. 2009). Debt service as a percentage of exports declined to 3.4 per cent by 2006. The ratio of public external debt to GDP declined by more than half from 37 per cent in 2005/06 to 16.6 per cent in 2007/08 (Nkhata 2009). Similarly, the public external debt stock was cut nearly by half to \$4.69 billion in 2006/07. Debt service payments were cut substantially from about \$193 million in 1999/00 and \$121 million in 2000/01 at the completion point to as low as below \$50 million a few years thereafter, before starting to rise markedly especially from 2012. Debt service as a percentage of government revenue declined from 19 per cent in 2000/01 before the HIPC Initiative to an average of 7.7 per cent during the period 2000/01–10/11.

The debt relief initiatives not only lessened the debt burdens of recipient countries but also acted as a catalyst to economic growth. This is supported by a study by Cassimon et al. (2015) which showed that debt relief, especially the enhanced HIPC Initiative, had had a positive impact on recipient countries' total domestic revenue and public investment. Most of the HIPCs used the breathing space to accumulate more debts, some of them from non-concessional sources. Consequently, recent data indicate that debt service burdens in post-HIPCs, including Tanzania, are on average rising.

3 Recent macroeconomic indicators and the evolution of post-HIPC debt

3.1 Recent macroeconomic indicators

Tanzania is one of the few countries in the region that have registered a notably high real GDP growth rate, averaging 6–7 per cent a year over the last decade—no mean achievement for a low-income country. That notwithstanding, concerns have been raised regarding the quality of growth

in terms of economic transformation and inclusivity. While the poverty rate has declined, the absolute number of poor citizens has not, given the high population growth rate (World Bank 2019). The decline in the current account deficit from as high as 10 per cent in 2014 to 3.5 per cent of GDP by 2018 was partly aided by a decline in oil imports (Table 1). In terms of composition, export growth has stagnated. The export of goods and services as a percentage of GDP is about 17.2 per cent on average.

Tanzania's fiscal deficit has remained relatively low, which could be an indication of effective management of public spending. However, the fiscal deficit increased to 4.3 per cent of GDP in 2017/18 from 1.5 per cent in the previous fiscal year. The relatively lower deficit in 2016/17 reflected a slow budget execution, and delays in external financing and project preparation and implementation (IMF 2018b).

Table 1: Recent macroeconomic indicators

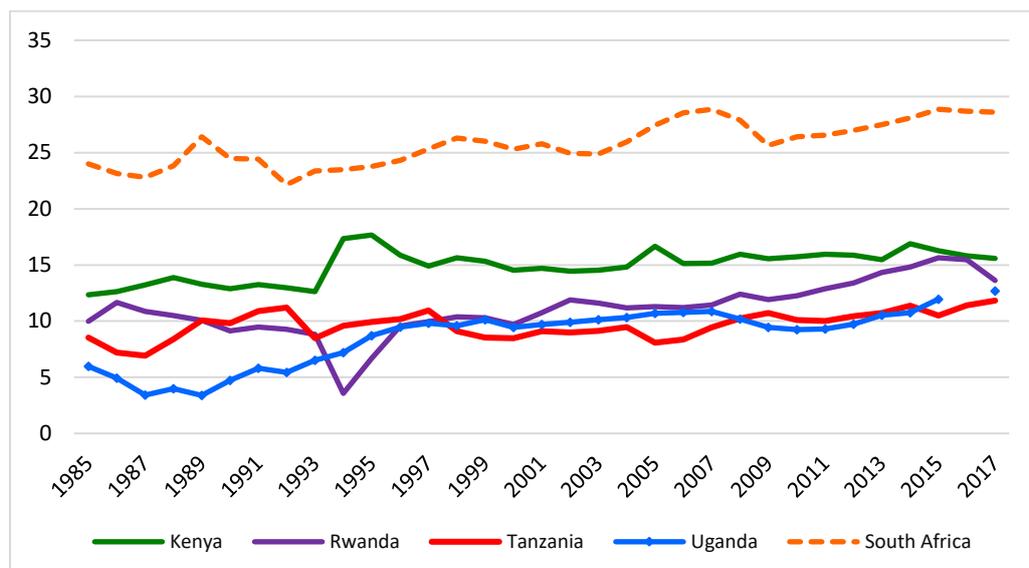
Indicator	2014	2015	2016	2017	2018	2019**
Real GDP growth	6.7	6.2	6.9	6.8	7.0	6.3
Public debt to GDP (%)	32.6	33.4	37.1	39.6	38.5	38.2
National debt to GDP* (%)	37.7	38.8	43.8	46.4	46.1	48.6
External debt to GDP (%)	39.0	30.6	35.7	34.6	35.0	37.5
Total investment to GDP(%)	37.6	32.7	32.1	34.0	38.9	37.5
Exports to GDP (%)	17.5	19.9	17.7	16.8	17.0	17.3
Imports to GDP (%)	27.6	25.3	19.7	19.1	20.2	20.4
Current account balance to GDP (%)	-10.0	-7.9	-4.2	-2.9	-3.5	-3.2
Fiscal deficit to GDP (%)—FY	-2.7	-3.5	-1.5	-4.3	-1.3	-2.5
Domestic savings to GDP (%)	24.3	25.3	30.0	30.2	30.6	33.4
GDP per capita (US\$)	1,030	947	966	1,002	1,039	1,104
GDP per capita (constant) growth	3.6	3.0	3.7	3.6	3.8	3.2
External debt stocks % of exports	165.8	179.4	204.4	221.2	238.7	256
Population (millions)	48.5	49.9	51.5	53.1	54.6	56.3

Note: * including private debt; ** estimate; FY = fiscal year.

Source: authors' compilation based on IMF and Ministry of Finance and Planning data and World Bank (2020b).

Tax revenue as a percentage of GDP has remained more or else constant, averaging about 11 per cent over the period 2000–17, which is still relatively low by regional standards (Figure 3). Although there has been a slight increase in recent years following the various tax reforms undertaken to enhance tax compliance and administration, the tax base is still narrow. Domestic revenue mobilization is critical in terms of the ability or capacity to service and pay debt, but more importantly, as a revenue base for funding the much needed growth and development of the economy.

Figure 3: Tax revenue as a percentage of GDP



Source: authors' compilation based on ICTD and UNU-WIDER (2019).

Though the country has made notable economic progress, Tanzania's income per capita is still low, with an estimated nominal GDP per capita of US\$1,104 in 2019 (Table 1). Tanzania's development vision is to become semi-industrialized by 2025. However, the country has had to borrow in a bid to meet the development goals. This has mainly been undertaken through external borrowing, given the relatively thin domestic financial market.

Thanks to the debt relief initiatives, there has been an ample space for public borrowing over the years, leading to a rapid accumulation of debt, especially in recent years. Public debt as a percentage of GDP rose to 38 per cent as at end 2016/17 from 21 per cent about a decade before that. Total national debt including private debt increased to 48.6 per cent in 2019 from 37.7 per cent in 2014. External debt stock as a percentage of exports increased by 54.4 per cent over the same period, to 256 per cent. However, given the rising costs of servicing debt coupled with the relatively low domestic tax revenue base and saving rate, and in light of dwindling foreign aid inflows,⁷ the country faces a challenge in revamping development in terms of the huge investments in infrastructure and human capital that are needed to meaningfully grow and create jobs for the increasingly youthful population, while maintaining debt sustainability.

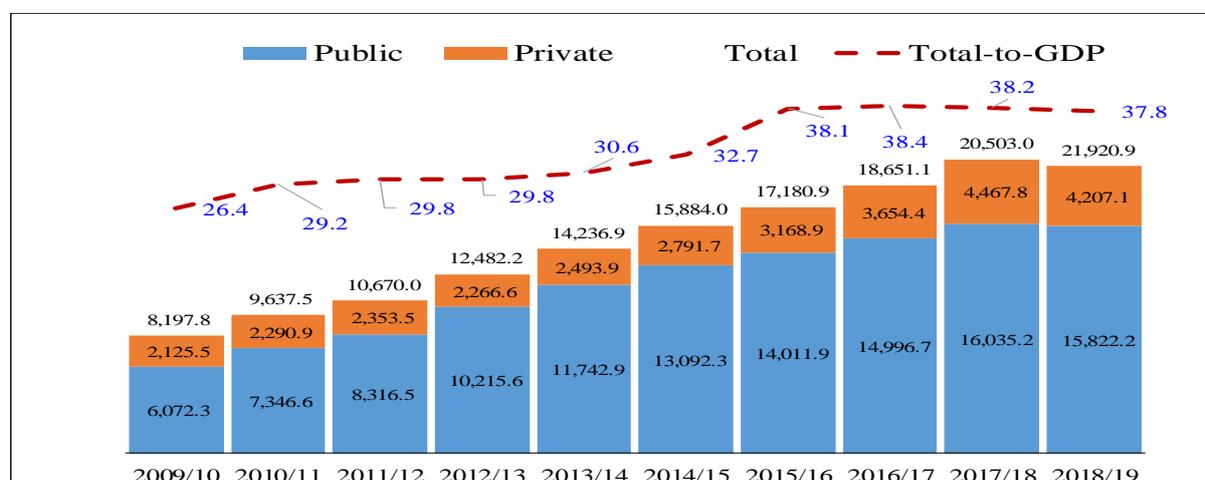
3.2 Trends and structure of Tanzania's post-HIPC debt

National debt stock, comprising external (public and private) and domestic debt, has evolved over time, largely driven by public sector debt. Total national debt increased to US\$28.4 billion at the end of June 2019 (about 49 per cent of GDP), from US\$7.6 billion at the end of June 2008 (31 per cent of GDP), an average increase of 24 per cent annually over the decade. In particular, external debt (public and private) also recorded an increasing trend during the last decade reaching US\$21.9 billion (37.8 per cent of GDP) with an annual average growth rate of 12 per cent (Figure 4). As at end of December 2019, national debt stood at US\$28.7 billion (Bank of Tanzania 2020).

⁷ External grants dropped from 5.7 per cent of GDP in 2004/05 to 1.2 per cent of GDP in 2014/15 (IMF 2018b).

Public sector debt has remained dominant, accounting for an average of 78 per cent of total external debt. Worth noting, the private sector external debt doubled to US\$4.2 billion as at end of June 2019 from US\$2.1 billion at the end of June 2010, an annual average increase of 8 per cent.

Figure 4: Composition of external debt by borrower (US\$ millions)

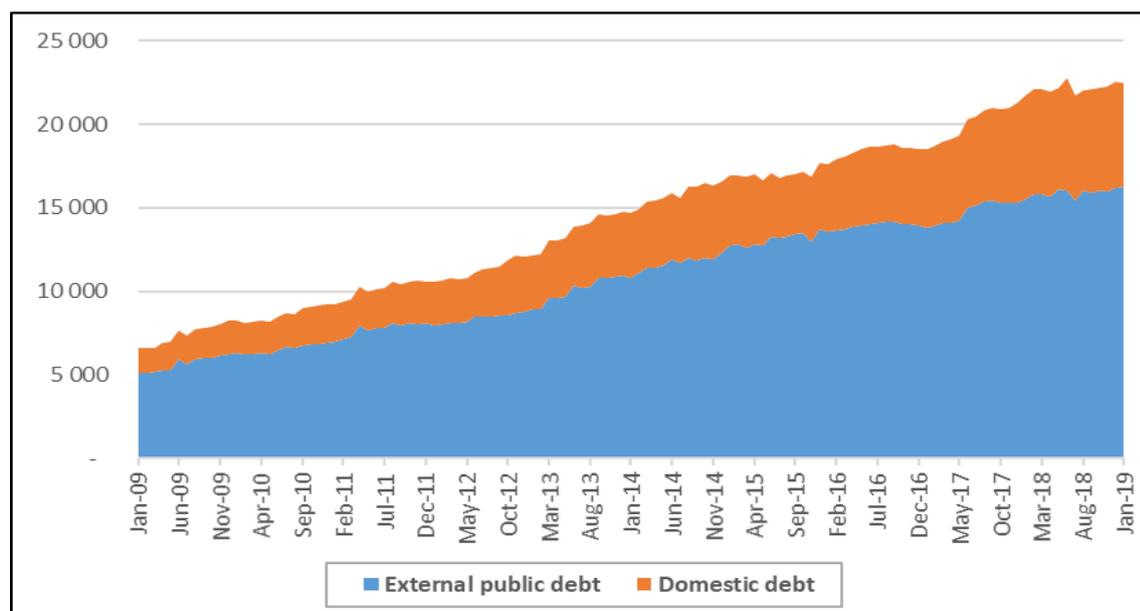


Source: authors' compilation based on Bank of Tanzania Annual Reports.

Evolution of public debt

Both external and domestic debt have been increasing in the post-HIPC period, with external debt accounting for a significantly higher proportion of public debt—73.7 per cent as at December 2019 (Figure 5). Although domestic debt still accounts for a relatively smaller proportion, it had increased steadily to 14,435.2 billion Tanzanian shillings (TZS) at the end of December 2019, with treasury bonds and stocks accounting for 79.6 per cent (Bank of Tanzania 2020).

Figure 5: Trend and composition of public debt (US\$ millions)



Source: authors' compilation based on debt series from Bank of Tanzania Monthly Economic Reviews.

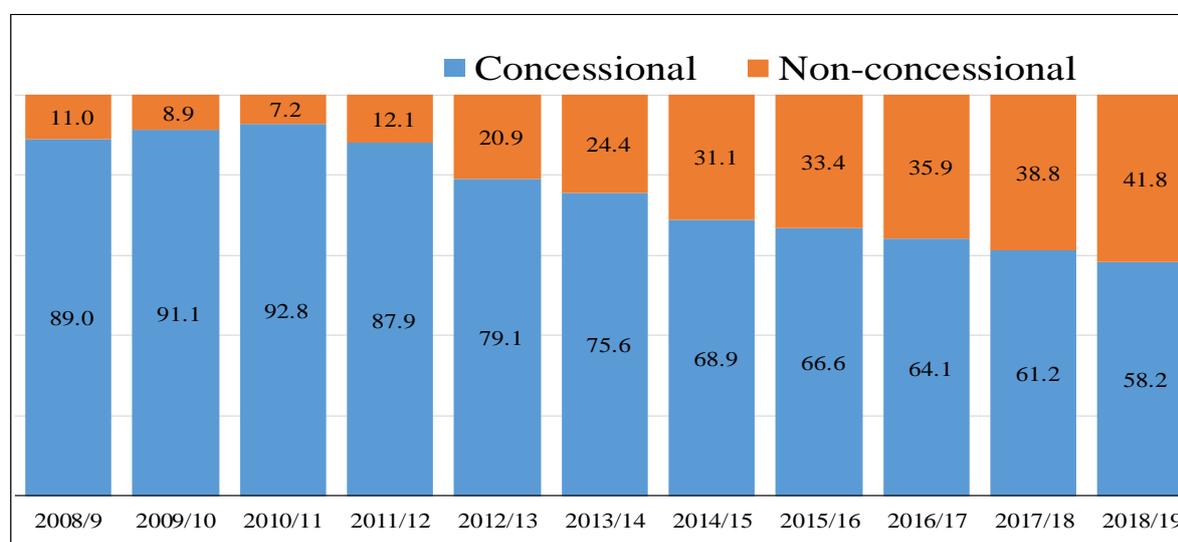
Tanzania's total public (domestic and external) debt stood at US\$22.5 billion as of June 2018 (38.7 per cent of GDP in nominal terms), up from \$6.1 billion (24.5 per cent of GDP) as at end of June

2008, representing an average increase of 4 per cent per annum during the period. External debt increased to \$15.8 billion as at end of June 2019 from \$4.4 billion at the end of June 2008, which represents an annual increase of 13 per cent over the decade. Growth in debt is mainly attributed to increased borrowing to finance public infrastructure projects, particularly those related to transportation, natural gas, and power generation and transmission.

External debt by concessionality

The rising financing needs to fund development projects have come at a time when the financing landscape is significantly changing. Traditional and relatively concessional sources of financing have been declining, giving rise to new non-concessional financing sources that are more complex, costly, and risky. Consequently, the proportion of non-concessional debt has been rising over time, reaching 41.8 per cent of total external debt by the end of June 2019, from below 10 per cent as at end of June 2011 (Figure 6).

Figure 6: Public debt classification by concessionality (%)

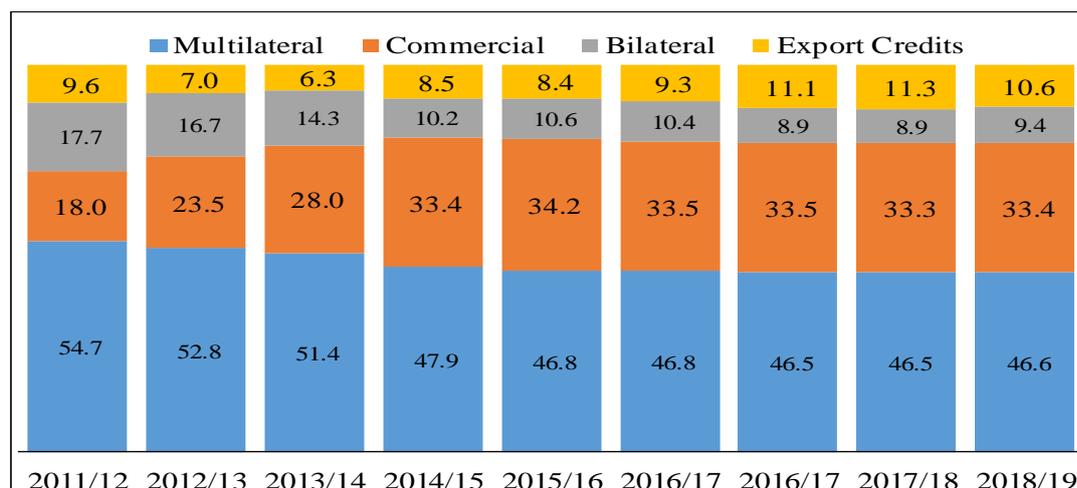


Source: authors' compilation based on debt series from Ministry of Finance and Planning and Bank of Tanzania.

Sources of external debt by type of creditor

Tanzania's external debt was traditionally linked to concessional sources—that is, multilateral and bilateral creditors. However, the post-HIPC period has been characterized by a gradual decline in the proportion of debt held by multilateral and bilateral creditors from 54.7 per cent and 17.7 per cent as at end of June 2012 to about 46.6 and 9.4 per cent as at end of June 2019, respectively. On the other hand, the period witnessed an increasing proportion of debt from commercial sources, from 18.0 per cent to 33.4 per cent (Figure 7). This has implications on debt servicing costs, given that the latter is relatively costlier.

Figure 7: Composition of external debt by creditor category (%)



Source: authors' compilation based on debt series from Bank of Tanzania Annual Reports.

Currency composition

The currency composition of public external debt shows that the debt portfolio is most exposed to the US dollar, followed by the euro, which is largely a reflection of the historical financing pattern, the international financial set-up, and the external trade pattern of the country (Table 2). Traditionally, the country has accessed more financing from international financial institutions using basket currencies, i.e. Special Drawing Rights and African Unit of Accounts, of which the US dollar is the dominant currency. The emergence of new lenders has not changed the currency composition—for instance, most of the financing from the exim banks of China, India, and South Korea have continued to be denominated in USD. Hence, there is an inherent currency risk, if, for instance, the domestic currency were to depreciate significantly against the dollar.

Table 2: Currency composition of external debt (%)

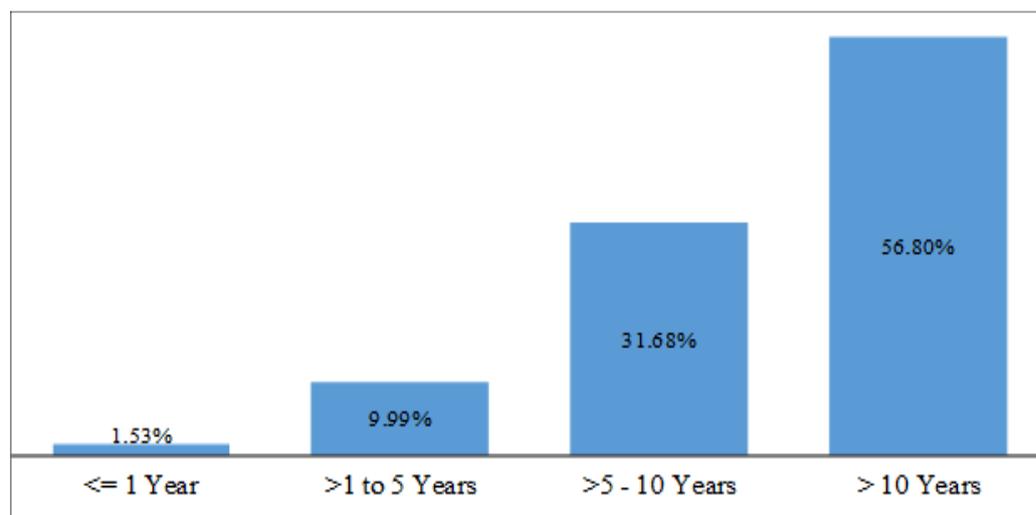
Currency	2010/11	2010/12	2010/13	2010/14	2010/15	2010/16	2010/17	2010/18	2010/19
US dollars	40.6	44.8	49.7	52.3	56.0	55.4	55.4	55.9	55.6
Euro	34.9	32.2	28.7	27.3	24.9	25.0	21.4	21.1	22.5
Japanese yen	10.2	9.6	8.2	8.0	7.5	8.6	7.9	7.8	7.8
Great British pound	9.0	8.4	7.5	7.2	6.7	6.6	4.7	4.8	4.7
Chinese yuan	3.7	3.5	4.7	4.0	4.0	3.6	9.7	9.7	8.8
Others	1.6	1.5	1.2	1.2	0.9	0.8	0.9	0.7	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: authors' compilation based on data from Ministry of Finance and Planning.

Maturity profile of external debt

The remaining maturity structure of public external debt as at end of June 2019 shows that more than half of the debt (56.8 per cent) will mature only after ten or more years, which reflects the significant portion of concessional debt in the portfolio (Figure 8). Based on the maturity profile, it can be argued that central government external debt is relatively less exposed to refinancing risk. However, the financing risks and challenges associated with the notable share of external debt of less than ten-year maturity cannot be ignored.

Figure 8: Profile of public external debt by remaining maturity as at end June 2019

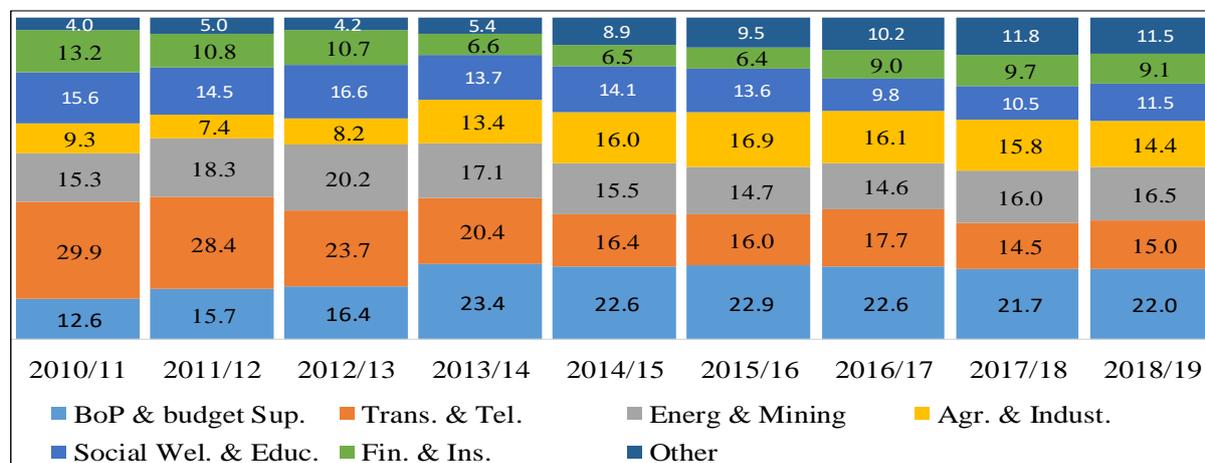


Source: authors' compilation based on data from Ministry of Finance and Planning.

External debt by use of funds

The profile of external debt by use of funds as at end of June 2019 indicates that most of the debt contracted was utilized for budget and balance of payments support, energy and mining, agriculture and industrial development, and transport and construction activities (Figure 9). The financed projects have already started to yield results in terms of significant improvement in transportation activities and economic growth.

Figure 9: Composition of external debt by use of funds as at end June 2019

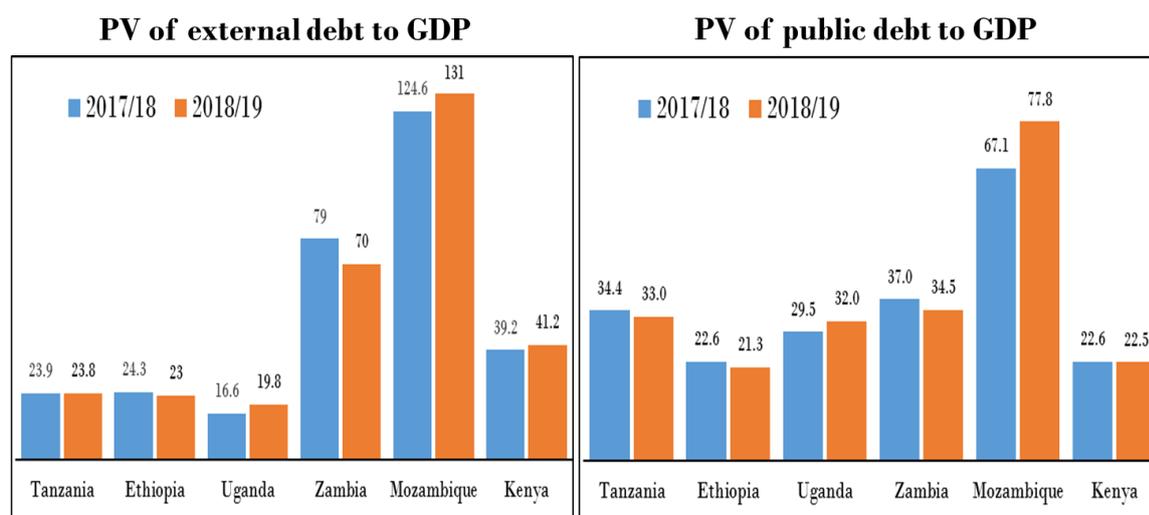


Source: authors' compilation based on debt series from Bank of Tanzania's Annual Reports.

3.3 Regional comparison

Despite the notable increase in debt in the post-HIPC and MDRI frameworks, the country's debt has been relatively low regionally. For instance, the solvency debt indicators in terms of the ratio of nominal and present value of external debt to GDP show that Tanzania's debt is below that of Mozambique, Zambia, and Kenya, though slightly higher than Uganda's (Figure 10). The present value (PV) of public debt to GDP is, however, comparatively higher than one for Kenya and Ethiopia.

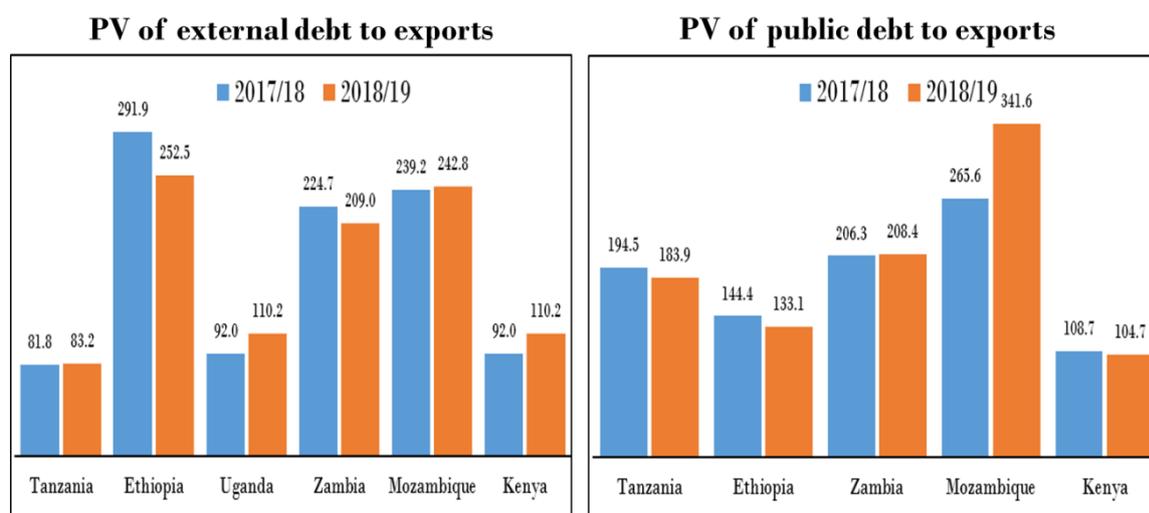
Figure 10: Present value of ratio of external debt and public debt to GDP (%)



Source: authors' compilation based on IMF data and World Bank (2020a).

Likewise, the liquidity indicators show that Tanzania's external debt-to-exports ratio is below that of some of her peers and neighbouring countries. However, in terms of public debt to exports, the ratio is slightly higher than that for Ethiopia, Kenya and Uganda (Figure 11).

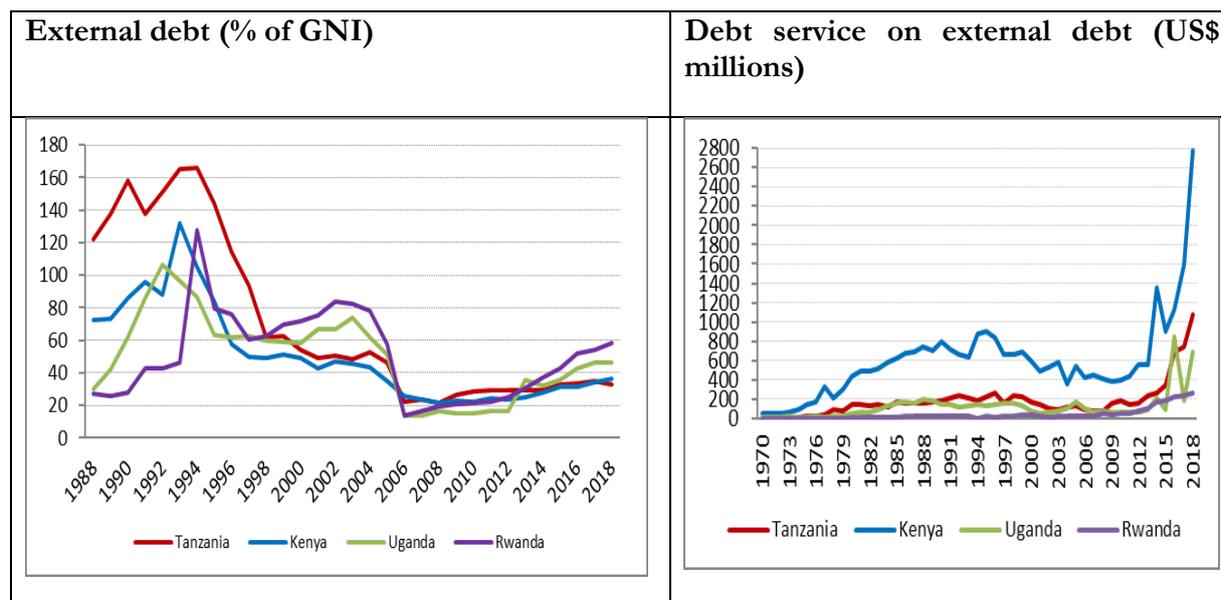
Figure 11: Present value of ratio of external and public debt to exports (%)



Source: authors' compilation based on IMF data and World Bank (2020a).

Figure 12 shows that whereas the ratio of external debt to GNI for Tanzania declined drastically relative to that of its peers after the cancellation of debt in early 2000s, the cost of external debt servicing has recorded a rising trend, with a sharp increase since the early 2010s. Though it is lower than Kenya's, the latter is not an HIPC and is classified as a lower-middle-income country.

Figure 12: Comparative external debt to GNI and debt service payments



Source: authors' compilation based on World Bank (2020a).

4 Literature review

In the literature, the standard approach to debt sustainability analysis focuses on the debt-to-GDP ratio. Public debt has the potential to increase liquidity in the economy, enhance consumption patterns, and improve citizens' wellbeing, which ultimately decreases the burden of borrowing on households. At the same time, the escalation of debt to higher levels can compromise a country's welfare, especially if it crowds out private investment and leads to lower output (Chatterjee et al. 2017). Analysis by Melina et al. (2016) shows that even for resource-rich developing countries, expanding public investment without putting in place saving or borrowing strategies can expose the economy to debt sustainability risks, particularly if public investment is inefficient or the anticipated future resource revenues are not realized.

Bassanetti et al. (2016) show that debt distress can be predicted on the basis of debt dynamics that go beyond actual debt levels—a declining debt-to-GDP ratio is often associated with less likelihood of debt distress, particularly under the scenario in which the debt ratio is rising. Using a probabilistic approach to predict the public debt of six emerging countries from different economic regions (Russia, Turkey, Argentina, Brazil, South Africa, and the Philippines), Paret (2017) found that fiscal policies do not necessarily act pre-emptively to prevent the debt ratio from rising. To assess the macro-fiscal linkages, a fiscal reaction function was estimated with a view to analysing how primary balance responds to debt ratio and output gap. The coefficient of the lagged debt ratio was positive and significant, indicating that countries' fiscal policy was responsive to debt. However, the response to the output gap was positive but statistically insignificant. Further analysis suggested that those emerging countries with strategies that promote fiscal responsibility have lower primary deficits or small surpluses. Countries that have accrued primary surpluses (the Philippines and Turkey) demonstrated the application of more sustainable debt strategies compared with those burdened by primary deficits (Argentina, South Africa, Russia, and Brazil). Consequently, strong fiscal responsiveness to debt (fiscal tightening whenever debt increases) is bound to enhance debt sustainability.

Makin and Pearce (2014) examined the sustainability of public debt at the subnational level in Australia and found that almost all administrative units such as states and general government territories had witnessed unstable debt levels. The study further showed that the capacity to stabilize debt depended on the cost of debt servicing and the size of public debt relative to gross state product (GSP), as well as the size of the primary budget balance. To improve the debt situation, all subnational governments were expected to transform primary deficits into surpluses.

Beqiraj et al. (2018) investigated government responses to debt accumulation using panel data for 21 dissimilar Organisation for Economic Co-operation and Development (OECD) countries. Variables utilized included cyclically adjusted primary balances, debt-to-GDP ratio, debt-to-potential-GDP ratio, output gap, and an indicator for business cycle. The study showed a close relationship between debt and structural primary balance, thus reaffirming the conclusion that unrestricted growth in the debt-to-GDP ratio for long periods can be detrimental. Structural primary balance also responded positively to transitory changes in GDP.

Mahmood et al. (2009) used traditional threshold debt ratios and theoretical models to assess the debt sustainability level of Pakistan over the 1975–2007 period. The study found that the debt sustainability challenge was precipitated by current account and fiscal imbalances. Similarly, Jayme (2001) investigated the sustainability of the external debt in Brazil based on Johansen cointegration tests. The results showed that in the long run, deficits in the current account and external debt were unsustainable. Tiwari (2012) analysed whether India had followed policies towards debt sustainability between 1970 and 2009 by examining primary surplus in relation to the debt-to-GDP ratio. However, the study could not establish concrete or precise evidence in support of public debt sustainability.

Using stochastic simulation methods, Karam and Hostland (2006) established probability projections of the public debt burden in the medium term with a view to assessing debt sustainability in emerging market economies. Public debt vulnerability to severe economic shocks was measured by assessing indicators such as volatilities in outputs, financial fragilities, and internal reactions of the risk premium and abrupt ceasing of private capital flows. External debt vulnerability was found to be sensitive to the exchange rate determinants as well as to prices of tradable goods. The results showed that in the medium term, the debt burden could be prevented from rising by adopting appropriate fiscal policies. Moreover, it was noted that factors such as volatilities in output and financial fragilities—especially over-dependence on short-term currency borrowing and sudden stops in private capital flows—matter.

Bökemeier and Stoian (2018) investigated debt sustainability in ten countries in Eastern and Central Europe by estimating a fiscal reaction function. The results showed that as of 2015, the debt ratios for Bulgaria and Romania were not sustainable. Moreover, linear trend analysis over a 20-year period showed volatile debt dynamics for Romania and Latvia. Comparisons between the stable debt ratios and the historical averages indicated sustainability of debt for most countries, except Bulgaria in the long run. However unclear results were reported for five countries—Slovenia, Czech Republic, Poland, Hungary, and Slovakia—indicating limitations of the model employed.

Llorca (2017) examined a cohort of 24 emerging and developing economies in Asia to assess external debt sustainability from 1993 to 2014. The study used the PV methodology to assess whether the external debt of countries—which were further grouped into the four regions of South-East, South-West, Central, and the Pacific—was sustainable in the long run. External debt was found to be sustainable for all the economies assessed.

Pradhan (2019) examined changes in the status of the external debt and externally induced vulnerability indicators in India. Notably, the size of the external debt of India had increased but was constant, at about 20 per cent, as a ratio of GDP. The rise in the external debt was attributed to borrowing by non-government sectors. India's vulnerability to externalities with regard to reserve adequacy indicators was noted to be comparatively low.

Ncube and Brixiova (2015) examined public debt sustainability in Africa over the 2008–12 period based on a debt-stabilizing primary-balance framework. The two main approaches to debt sustainability utilized were: (i) the IMF and World Bank approach, which focuses on the projection of the debt path in relation to given thresholds, and (ii) the debt-stabilizing primary-balance approach, which identifies primary balances needed to achieve a given debt path, based on various assumptions about changes in real interest rate and growth. A positive primary-balance gap⁸ would imply a rise of the debt-to-GDP ratio over a period of time without fundamental fiscal policy adjustment. The study found that in half of the countries examined, primary balances were above those needed to keep the level of public debt at 2007 debt levels, and in most cases above those required to ensure public debt sustainability. Sustainability was driven by the interest rate–growth differential (IRGD), accentuating the significance of growth or borrowing to enhance growth. Since in the long run IRGDs are likely to narrow, the study underscored the greater role of fiscal policies. In other words, African policy-makers needed to adopt sound fiscal policies while pursuing growth-enhancing investment, including through borrowing.

Using historical time series data spanning the period 1865–2010, Naraidoo and Raputsoane (2015) examined debt sustainability in South Africa, taking into consideration the possibility of non-linearities in the form of threshold behaviour by fiscal authorities based on recent history of indebtedness as well financial crises. The results showed a debt-to-GDP threshold ratio of about 56 per cent. The results further revealed that previous debt levels played a fundamental role in informing debt adjustment decisions. There was evidence in support of the need for fiscal sustainability, such that a rise in debt as a ratio of GDP beyond the threshold results in stronger fiscal consolidation.

Using data for the period 1970–2011, Kayandabila and Manyama (2013) concluded that the fiscal policy for Tanzania was unsustainable over the study period, based on analysis undertaken using unit root tests and cointegration tests. In his assessment of the main risks to public debt sustainability in post-HIPC countries Malawi, Uganda, and Tanzania, Nkhata (2009) noted the vulnerability of external debts to increased lending rates in these countries, and concluded that the acquisition of additional debt should be carefully analysed to ensure it is sufficiently concessional to promote future debt sustainability. The stress tests under the DSA analysis showed Tanzania's total public debt to be sensitive to low GDP and worsening primary balance.

Other than the DSA that is commonly undertaken by the IMF and the respective authorities in low-income countries, empirical analysis of debt sustainability in post-HIPC countries like Tanzania is limited. Most of the empirical literature on debt sustainability has focused on emerging and developing market economies. Most of the studies employ time series analysis that entails the estimation of a fiscal reaction function, with a general emphasis on the role of fiscal policy in ensuring debt sustainability. In terms of empirical analysis, we follow a similar approach by estimating a fiscal reaction for Tanzania.

⁸ The primary-balance gap is the difference between the stabilizing and the actual primary balance.

5 Conceptual framework

Assessing debt sustainability is complex, particularly given the dynamic nature of debt and the varied factors that drive both its accumulation and a country's ability to pay in the short run and long run. There is no universally accepted definition of sustainable debt, though there is a general consensus that exploding debt is not sustainable. Low or high debt levels do not necessarily imply that debt is sustainable or unsustainable in the long run. There are several factors that need to be considered when conceptualizing and considering public debt and its sustainability, especially in the context of developing African countries like Tanzania. These are briefly discussed below.

5.1 Debt sustainability as a necessary condition but not an end in itself

From a developmental perspective, borrowing, whether government or private, is an important avenue for financing the investment that is critical to achieving sustainable development goals. The role of government in the provision of public capital through public investment such as infrastructure is well acknowledged in development literature.

On one hand lies the historical Keynesian argument that scaling up public investment via government borrowing, while it may lead to an increase in the debt ratios in the short run, crowds in private investment and boosts export growth, hence spurring higher growth in the medium to long term and eventually lowering the debt ratios over time. Therefore, what matters is the sustainability of long-run growth and development, for which debt sustainability is a necessary condition and not an end in itself (Pinto 2018). However, this is based on the implicit assumption of efficient and productive public spending: efficiency and absorptive capacity play a role in determining the ultimate impact of public investment on growth, and hence an economy's ability to pay (Mustapha and Prizzon 2015).

At the macro level, the need for government borrowing follows from the standard macroeconomic identity:

$$Y \equiv C + I + G - T + X - M \quad (1)$$

where: Y is national output, C consumption, I investment, G government expenditure, T taxes, X exports, and M imports.

Equation 1 can be rearranged to obtain the following identity:

$$S - I \equiv G - T + X - M \quad (2)$$

where S is savings, $S - I$ is net savings, $G - T$ represents budget deficit after into-account transfers, and $X - M$ is the trade surplus (net exports).

From the identity in Equation 2, the excess of saving over investments ($S - I$) of the private sector equals the government budget deficit plus the trade surplus (the economy's external balance). Any sector in the identity that spends more than it receives must borrow to finance excess expenditure. Borrowing can arise when $S - I < 0$; $X - M < 0$; and $G - T > 0$.

The value of access to foreign credit to finance long-term growth depends on the development status of the country and availability of domestic funds (Stiglitz 2016). For most African countries the saving rates are low and capital is often in short supply, compared with developed or East Asian countries where the saving rate is relatively higher. That notwithstanding, short-term lending

could be of limited benefit compared with foreign direct investment (FDI) that brings with it access to new technologies and markets, entrepreneurship, and capital (Stiglitz 2016).

On the other hand, high debt burdens can impede growth and sustainable development, and could lead to debt overhang.⁹ If the cost of debt servicing becomes overly high, it could implicitly lead to higher taxes due to the government's need to collect more revenue in order to meet external debt obligations, and could thus act as a disincentive to domestic investment (Mustapha and Prizzon 2015). There is a vast literature on the negative effect of debt overhang on investment that particularly emerged after the debt crisis of the 1980s in developing and low-income countries (see Sundell and Lemdal 2011).

5.2 Debt dynamics matter

The critical level of debt depends on the 'state of nature', i.e., a variety of factors that determine the prospects of a country (Stiglitz 2016). Although the country may be viewed today as being far below debt limits, its exchange rate may suddenly deteriorate, interest rates could rise, and/or GDP may fall, leading to an increase in the (domestic) value of debt and lowering the country's debt capacity. In this context, it is not only the debt levels that matter but also the debt dynamics. Debt levels provide an incomplete picture. The debt dynamics are closely linked to structural vulnerability and exposure to global shocks, such as volatility in commodity prices, which can adversely affect export earnings and the ability to service the debt, especially for a less diversified economy.

Solvency and liquidity debt indicators are commonly used in debt sustainability analysis. Solvency risk refers to the capacity and overall viability of a country's economy to accommodate and meet debt obligations—measured by debt-to-GDP ratio relative to a given threshold. Liquidity risk reflects a country's ability to manage and meet debt service obligations falling due—measured as the ratio of debt service to exports and to revenue. These two sets of challenges are not necessarily congruent—a country could prospectively be in trouble in one category of risk while not in the other. It is important for the debt ratios to be considered in conjunction with the overall dynamics of key domestic and external factors that determine the actual outcome in the medium to long run.

5.3 Composition of debt

Unlike the external debt accumulation of the 1970s and 1980s (before the HIPC Initiative) among the low-income countries, which was largely due to an increase in debt to multilateral institutions, the current build-up is largely due to a significant increase in commercial borrowing. Since 2006, for instance, more than ten SSA countries including Tanzania have issued foreign currency bonds in international debt markets. Other countries that have issued sovereign bonds include Kenya, Nigeria, Senegal, Zambia, Rwanda, Ghana, and South Africa. The maturities of the bonds generally range from five to ten years. This relatively short maturity structure does not match the life of infrastructure projects with much longer gestation periods of investment returns (Coulibaly et al. 2019, Ndulu 2018).

Increased access to international capital markets has introduced new financing opportunities but also new risks, such as exposure to volatility in interest rates and international capital flows. It has also translated into higher debt servicing costs. Ndulu and O'Connell (2019) observe that development assets, which include hard-acquired improvements in institutions, infrastructure

⁹ This is a situation in which the debt burden is so large that earnings generated by new investment are entirely appropriated by existing debt holders, in which case the debt burden leads to an implicit tax on domestic capital.

projects nearing fruition, and human capital formation are at stake. Debt servicing costs, as well as the design features of debt contracting and the creditor structure, matter to a country's ability to achieve debt sustainability (Coulibaly et al. 2019). The risk of debt-induced fiscal distress is heightened by maturity mismatches, rollover risks, currency mismatch, and coordination challenges in debt restructuring, especially given a plurality of creditors, reflecting the increase in private creditors and non-Paris Club members (Ndulu and O'Connell 2019).

In general, the region's bilateral debt has increasingly shifted towards non-traditional lenders such as China, India, and South Korea, away from the Paris Club member countries. In 2017, the Paris Club countries owned less than 7 per cent of Africa's outstanding external debt, compared with 15 per cent in 2008 (Coulibaly et al. 2019). With most of the debt denominated in foreign currency, the depreciation of domestic currencies has a negative effect, since most of the government revenues are in local currency, unless exports are substantively boosted to counter or pay off the debt burden.

Also worth noting is the distinction in the risk profile between domestic and external debt. Whereas high demand for domestic debt can have repercussions on local interest rates if financial markets are relatively thin or not well developed, it is easier to deal with the latter in terms of roll-over and less exposure to exchange rate volatility.

5.4 The denominator matters

Whereas the focus is often on the numerator (debt), and perhaps the quantity of the denominator (GDP), the composition and quality of the denominator matters. For instance, from the aggregate demand identity in Equation 1, export (X) growth is important as a key source of foreign exchange earnings, given that foreign debt is mostly contracted and paid in foreign currency. On the domestic front, the ability to generate domestic revenue is important, the key component being domestic tax (T) revenue in most cases.

5.5 Macroeconomic and public debt management

The sustainability of public debt can be interpreted as the outcome of the interaction of fiscal policy with the economic environment, which goes beyond a statistical concept as often depicted in the recent literature. If debt is not to explode over time, policy-makers have to respond to the changing conditions in the macroeconomic environment (Collignon 2012). Debt levels can be low but, if not prudently managed, could still lead to accumulation and sustainability challenges. Public debt management entails establishing and executing a strategy for managing the public debt in a way that raises the required amount of funding at the lowest possible cost over the medium to long term, while taking into consideration exposure to market factors such as exchange and interest rate volatilities (IMF 2014).

Moreover, as countries continue to witness a rise in contingent liabilities, particularly after the global financial crisis, a consolidated fiscal account that takes into account explicit and implicit government contingent liabilities is critical in the assessment of exposure to debt risk. The situation could get worse in the aftermath of the COVID-19 pandemic.¹⁰

¹⁰ The novel virus that originated in Wuhan in China was declared a global pandemic in March 2020.

6 Methodology: public debt sustainability assessment frameworks

Besides exploratory analysis of the evolution and structure of debt, debt sustainability is examined based on the commonly applied debt sustainability framework developed by IMF and World Bank and an empirical estimation of a fiscal reaction function for Tanzania.

6.1 IMF-World Bank debt sustainability framework

The standard approach to DSA focuses on the debt-to-GDP ratio. The IMF-World Bank Debt Sustainability Framework for Low-Income Countries (LIC DSF) and Debt Sustainability Framework for Market Access Countries (MAC DSF) are the most commonly used frameworks for assessing and conducting DSA. The frameworks were introduced in 2005 and have since undergone various developments, with the latest review in July 2018. They are widely used by the Bretton Woods institutions, lenders, and borrowers as the main basis for providing guidance for lenders' borrowing and creditors' lending decisions.

The DSA consists of an analysis of a country's projected debt burden over the next ten years and its vulnerability to shocks, based on medium-term projections of macroeconomic variables and assumptions regarding changes in the primary balance, on the basis of which baseline and stress tests are calculated. The assessment of the risk of external and overall debt distress is based on the debt burden thresholds and benchmarks (Table 3). The framework focuses on the present value of debt obligations for comparability. A 5 per cent discount rate is used to calculate the PV of external debt. To assess debt sustainability, debt burden indicators are compared with indicative thresholds over the projection period. The risk of external public debt distress is based on four ratings: low risk, moderate risk, high risk, and in debt distress. The key advantage of the DSF/DSA framework is its simplicity, which allows it to be easily replicated for different countries.

Table 3: Debt burden thresholds and benchmarks under the DSF

	PV of external debt in % of		External debt service in % of		PV of total public debt in % of
	GDP	Exports	Export	Revenue	GDP
Weak	30	140	10	14	35
Medium	40	180	15	18	55
Strong	50	240	21	23	70

Source: reproduced from IMF (2020).

The DSF, though heavily relied on, has received its own share of criticisms based on its limitations. For instance, one of the criticisms is that the focus on the present value of debt is outdated. Moreover, only concessional external debt is discounted, at an arbitrary discount rate of 5 per cent. According to Pinto (2018), given the profusion of different types of public debt—concessional, market debt, Eurobonds, and non-concessional bilateral loans—at different interest rates, today, nominal debt makes more sense, and it is the weighted average of these different types of public debt that is relevant for debt dynamics. Additionally, the IMF-World Bank framework has been found to be overly optimistic with respect to projections and assumptions about growth and fiscal adjustments, yet borrowing agreements are based on DSA obtained using the framework, which means that countries keep borrowing (Atingi 2019). Analysis by Atingi (2019) showed a tendency to optimism bias, with significant errors in the growth forecasts for some countries. Moreover, the fact that simulations do not take into account the uncertainty of macroeconomic forecasts given the volatile global environment faced by low-income and emerging market economies has been noted as a major drawback (Paret 2017). Additionally, the DSF does not distinguish debt

sustainability that arises due to misuse of public resources and weak fiscal institutions from that linked to large but relatively more meaningful investments in infrastructure.

Concerns have also been raised regarding the need for country-specific benchmarks for domestic debt and total public debt beyond internationally set benchmarks for assessing sustainability and vulnerabilities. Moreover, robust analysis of variables that drive debt relative to GDP, fiscal deficits, interest rate differentials, exchange rate risks, and current account deficits is critical.

6.2 Fiscal reaction function

Governments face a PV borrowing constraint in the sense that they must intertemporally balance their budgets by setting the current market value of debt equal to the discounted sum of expected future surpluses. A violation of intertemporal budget balance can be taken as an indication that the fiscal policy is not sustainable in the long run, since the value of debt would explode over time at a rate faster than the growth rate of the economy (Collignon 2012). This, however, does not necessarily mean that budgets must be balanced.

The empirical literature focuses on testing the sustainability of the intertemporal budget constraint through the use of univariate and multivariate techniques, particularly focusing on tests for the presence of unit roots and fiscal rules (Bartoletto et al. 2013). Among the most influential works in this context include Trehan and Walsh (1988) and Bohn (1998). However, Bohn (2007) cast doubt on the necessity of stationarity and cointegration restrictions. The definition of sustainability based on the PV budget constraint has also been criticized as being ad hoc, with little economic argument (Bohn 2007).

Following Bohn (1998), a model-based approach of testing sustainability by estimating an appropriate policy rule, i.e. a reaction function for the primary surplus to the debt-to-GDP ratio, is recommended. This representation of debt sustainability refers to a relationship between public debt and primary surplus, such that when the debt rises, a sustainable fiscal policy requires an increase in primary surplus. The essence is to capture the relationship between a fiscal instrument (primary balance) as an indicator of changes in economic policy and debt stability which reflects the fiscal goal.

In line with Bohn (1998), if the government reacts quickly and efficiently to changes in government debt through primary balance, the danger of government debt becoming unsustainable is averted. Based on fiscal reaction analysis, government debt is considered to be sustainable if past evidence shows that the budget improves in response to a rise in government debt (Bartoletto et al. 2013; Tóth 2011).

Following Bohn (1998, 2005), a fiscal reaction function for Tanzania is estimated. Fiscal reaction function typically describes a country's fiscal response, as captured by the primary balance, to changes in debt levels and business cycle fluctuations (output gap). A positive and statistically significant fiscal response coefficient is a sufficient condition for debt sustainability. In line with similar empirical studies such as Paret (2017) and Bartoletto et al. (2013), the equation allows for smoothed adjustment of primary balance by including lagged primary balance on the right-hand side. Allowing for primary balance to depend on its past values controls for possible deficit bias and sluggish budget response. Econometrically, this also controls for serial autocorrelation. The basic equation is specified as below:

$$pb_t = a_0 + a_1 d_{t-1} + a_2 pb_{t-1} + a_3 og_t + \varepsilon_t$$

Where pb is primary balance measured as a ratio to GDP; d_{t-1} is the debt at the end of previous period measured as ratio to GDP, og_t is the output gap at time t and ε_t is the error term.

The above equation is estimated using general method of moments (GMM). This approach is best suited to dealing with potential endogeneity. However, the ordinary least squares (OLS) estimation results are also reported for robustness. The data used for the empirical analysis cover the period 1970–2019.¹¹ Data are from statistics produced by the IMF and World Bank, Ministry of Finance and Planning, and National Bureau of Statistics.

7 Results of debt sustainability analyses

This section provides results of the debt sustainability analyses based on the IMF-World Bank DSF and empirical estimation of the fiscal reaction function. The discussion of the former is based on the analysis conducted recently by the government of Tanzania¹² using DSF.

7.2 Debt sustainability analysis based on the DSF

The IMF and the World Bank usually work with low-income countries to produce regular DSAs using DSF. The latest DSA for Tanzania is, however, not publicly available. Nonetheless, the DSA conducted by the government of Tanzania in 2019 using outstanding debt as end of June 2019 showed that, despite the notable debt accumulation in the post-HIPC period, external (public and private) debt are sustainable for all indicators under both baseline and shock test scenarios (Ministry of Finance and Planning 2019). The analysis was based on strong performance indicators following the reclassification of the country in 2018 using the composite index of Country Policy and Institutional Assessment (CPIA) and macroeconomic performance.

The risk of public external debt distress was reported to be low under baseline and shock scenarios, albeit with sensitivity to exchange rate volatilities and export shocks. According to the analysis conducted, the PV of external debt to GDP will increase moderately, from 16.3 per cent at the end of June 2020 to 18.2 per cent in June 2022, and will thereafter decline to 9.1 per cent in 2039/40 (Table 4). Likewise, the PV of external debt to export is projected to increase from 103.9 per cent in June 2020 to 116.7 per cent in 2022/23 and around 53.5 per cent in the next 20 years.

The projections are, however, predicated on strong GDP growth in the future and slow-down in government borrowing after completion of the major infrastructure projects under the ‘Five-Year Development Plan II’.

The liquidity ratio as measured by debt service to export is projected to decline from 11.9 per cent at the end of 2019/20 to about 9.5 per cent in the medium term and further to 7.9 per cent at the end of 2039/40. Fiscal indicators suggest that the PV of public debt to GDP will increase moderately from 27.1 per cent at the end of June 2020 to 33.2 per cent at the end of June 2030 before declining to 28.2 per cent in 2039/40. Despite fluctuations during the projection horizon, the ratio remains below the threshold of 70 per cent. Likewise, the PV of debt to revenue and

¹¹ The data covers a longer period including pre-and post-HIPC periods and hence is fairly balanced. The post-HIPC time series is too short.

¹² By the Ministry of Finance and Planning in conjunction with Bank of Tanzania.

grants is projected to rise from 163.7 per cent at the end of June 2020 to 202.5 per cent at the end of June 2030, and to decline thereafter to 160.9 per cent by end of June 2040 (Table 4).

Worth noting is the fact that the DSA results show that between 2021 and 2022, Tanzania’s debt profile will be characterized by maturity bunching as shown by the rising external debt solvency and liquidity indicators. While conventionally the use of appropriate sinking funds provision to smooth the process of liquidity mobilisation for bullet debt service repayment is advisable, the challenge is the availability of resources for such provision, given that the country is implementing major development projects. Of greater importance is ensuring that the borrowing is directed to projects that promote sustainable economic growth.

Apart from the conventional thresholds embodied in the DSF template, Article 3 of the Government Loans, Guarantees and Grants Act, CAP 134, has been instrumental in protecting the liquidity position of the government as the impact of each and every loan on debt service payments is evaluated against three-year historical averages of domestic revenue and export proceeds. Likewise, government borrowing is guided by the ‘Medium-Term Debt Management Strategy’, which is updated annually. These have been instrumental in avoiding the pitfalls that contributed to the debt crisis before debt cancellations under the HIPC Initiative.

Table 4: Debt sustainability analysis results

	Threshold	2019/20	2020/21	2021/22	2022/23	2023/24	2029/30	2039/40
<i>External DSA</i>								
PV of debt to GDP	55	13.3	16.8	17.6	18.2	18.0	13.7	9.1
PV of debt to exports	240	103.9	105.5	110.9	116.7	115.4	83.9	53.5
Debt service to exports	21	11.9	11.1	9.5	10.3	11.2	11.7	8.1
Debt service to revenue	23	11.9	11.9	10.1	10.7	11.6	11.8	7.9
<i>Fiscal DSA</i>								
PV of debt to GDP	70	27.1	27.5	28.1	29.2	29.6	33.2	28.2
PV of debt to revenue	N/A	163.7	175.6	178.4	185.3	187.8	202.5	160.9
Debt service to revenue	N/A	33.4	29.7	27.5	29.3	29.9	46.8	44.8

Source: authors’ compilation based on Ministry of Finance and Planning (2019).

According to the previous IMF-World Bank DSA for Tanzania conducted in December 2017, the risk of debt distress was indicated to be low, based on the assumption of a strong economic growth path and a projected decrease in the current account deficit, among other assumptions (IMF 2018b). Nonetheless, some debt indicators were found to be sensitive to various shocks. In particular, a one-time depreciation shock was the most extreme scenario among bound tests for most of the ratios, confirming the sensitivity of the Tanzanian economy to shocks stemming from exchange rate volatility, especially for the debt-service-to-revenue indicator. Additionally, costlier terms of external finance underscored a degree of vulnerability in the debt-to-exports measure (IMF 2018b).

Besides the impact of the debt relief that substantially reduced the country’s debt burden, the low debt distress risk assessment underscores the sound macroeconomic and fiscal management that has also been associated with robust growth in recent years. Nonetheless, the sensitivity to the exchange rate and export shocks noted in both recent and previous DSAs portends liquidity risks. The challenges from maturity and currency mismatches are linked to liquidity risks. In view of the rising debt accumulation and debt servicing, reliance on commercial debt could be too costly and should, hence, be used cautiously. Given the need for the scaling up of development spending to address infrastructure gaps, it will be vital to leverage more on concessional borrowing, coupled with enhanced efficiency of public investment and debt management—particularly in light of the changing structure of debt. The results generally underscore Tanzania’s vulnerability to external

shocks, the importance of expanding the export base and boosting domestic revenue sources, and prudent fiscal management over the medium to long term.

The DSA outcome of low risk of debt distress should not create room for complacency, nor be misconstrued to imply that there are no significant risks that could materialize, particularly given the strong assumptions that underpin the projections, the general limitations of the DSF, and uncertainties in the global economy. The tightening of financing conditions, potential exchange rate depreciation, and vulnerability to export shocks in view of the recession in key export markets and a fragile global economy in the wake of the notable socioeconomic impact of the COVID-19 pandemic pose risks to the growth of the economy and to debt prospects.

7.2 Empirical results based on fiscal reaction function

The empirical results of the fiscal reaction function estimated using GMM are reported in Table 5.¹³ Equation 1 refers to the basic equation as previously specified, with fiscal balance on the left-hand side and lagged public debt ratio, lagged fiscal balance, and output gap as explanatory variables. In line with the empirical literature, a positive and statistically significant coefficient of lagged public debt to GDP connotes evidence of debt sustainability. Though positive, the coefficient of lagged public-debt-to-GDP ratio in the basic model was, however, found to be statistically insignificant, signifying lack of compelling empirical evidence. Equation 2 shows that the coefficient is only significant at the 10 per cent level after inclusion of a dummy variable capturing the significant liberalization reforms undertaken in 1993, which were associated with improved fiscal balance.

Table 5: Empirical results—public debt

	GMM		OLS	
	Equation 1	Equation 2	Equation 1a	Equation 2b
Fb(-1)	0.10*** (7.92)	1.15*** (8.15)	0.73*** (7.05)	0.70*** (7.64)
Pub(-1)	0.008 (1.24)	0.016* (1.70)	0.009 (1.00)	0.01* (1.70)
Ygap	-0.13 (-1.09)	-0.22 (-1.44)	0.01 (0.06)	0.08 (0.75)
D1993		-0.08* (-1.65)		-0.04*** (-2.81)
D2001				0.03** (2.40)
Constant	-0.005 (-0.79)	-0.006 (-0.64)	-0.01* (-1.75)	-0.02** (2.00)
Adjusted R-squared	0.55	0.60	0.58	0.70

Note: *** indicates 1%, ** 5%, and * 10/% levels of significance; t-statistics in brackets; FB(-1) = lagged fiscal primary balance, Pub(-1) = lagged public-debt-to-GDP ratio, Ygap = output gap, D1993 and D2001 = dummy variables for 1993 and 2001; J-statistic (GMM eq.1) = 0.99 (0.32); GMM eq. 2 is exactly identified.

Source: authors' own analysis.

¹³ The instruments used, which include lagged output gap and exchange rate, besides satisfying the identification conditions, are consistent with those applied in related studies such as Paret (2017). For robustness, the equation was also estimated using ordinary least squares.

In general, empirical evidence of debt sustainability is weak.¹⁴ With regard to the other variables, lagged fiscal balance is highly significant, which indicates a sluggish fiscal budget response consistent with the literature. However, the output gap was found to be statistically insignificant. The OLS results depict similar outcomes.

Besides the reaction function using public (external and domestic) debt-to-GDP ratio, the reaction function is also estimated using external-debt-to-GDP ratio given the significant share of the later. The empirical results are reported in Table 6. The results generally mirror the ones reported using public debt as a ratio of GDP. Lagged external debt to GDP coefficient is statistically insignificant in equation (1) and only significant at 10 per cent level of significance in equation (2).

Table 6: Empirical results—external debt

	GMM		OLS	
	Equation 1	Equation 2	Equation 1a	Equation 2b
Fb(-1)	1.09*** (7.73)	1.17*** (7.71)	0.75*** (7.21)	0.77*** (7.82)
Ext(-1)	0.008 (1.40)	0.010* (1.74)	0.005 (1.00)	0.007 (1.45)
Ygap	-0.18 (-1.57)	-0.21 (-1.38)	-0.01 (-0.10)	0.02 (0.11)
D1993		-0.07* (-1.65)		
Constant	-0.003 (-0.49)	-0.001 (-0.19)	-0.01* (-1.93)	-0.03** (-2.01)
Adjusted R-squared	0.47	0.52	0.58	0.68

Note: *** indicates 1%, ** 5%, and * 10/% levels of significance; t-statistics in brackets; FB(-1) = lagged fiscal primary balance, Pub(-1) = lagged public-debt-to-GDP ratio, Ygap = output gap, D1993 and D2001 = dummy variables for 1993 and 2001; J-statistic (GMM eq.1) = 0.99 (0.32); GMM eq. 2 is exactly identified.

Source: authors' own analysis.

Overall, the estimation results do not provide compelling empirical evidence of debt sustainability. The responsiveness of fiscal policy in containing increases in government debt is not strongly supported. However, the finding that increases in debt are positively associated with some improvement in government deficits is consistent with relatively lower national deficits that have been experienced in the past. Nonetheless, the lower deficits could also be attributed to the significant foreign aid support received in the past, which may not necessarily be guaranteed in future.

8 Conclusion and policy implications

Rising public debt in SSA has been a subject of debate regionally and globally. Although Tanzania's public debt has risen rapidly in recent years, it has not attracted much attention in comparison with that of other countries in the region, particularly Kenya and Ethiopia. This paper provides an analysis of public debt and debt sustainability from a macro perspective focusing on external debt. External debt accounts for over 70 per cent of public debt in Tanzania.

Tanzania is among the first countries that benefited from debt relief under the HIPC Initiative and MDRI. By the 1980s, the country was already struggling with debt servicing, and by the 1990s, the

¹⁴ Moreover, it is worth noting that the period of estimation covers the debt relief period.

debt situation had become worse, with public-debt-to-GDP ratios in excess of 100 per cent. Debt relief initiatives reduced the debt burden considerably, thereafter leading to favourable debt indicators and ample space for public borrowing. However, there has been a rapid debt accumulation lately, largely driven by the need to fund infrastructure projects in the country. Although concessional debt still accounts for a higher share, its share has declined to less than 50 per cent while the proportion of commercial and short-term debt has risen. Consequently, the cost of debt servicing is increasing.

Despite the increase, the latest DSA conducted by the government of Tanzania indicates that the risk of public external debt distress is low under the baseline and shock scenarios, albeit sensitive to exchange rate volatility and export shocks. Nonetheless, this DSA is an indication of sensitivity to liquidity risks. Furthermore, the analysis is predicated on strong assumptions of robust GDP growth in the future and a slow-down in government borrowing after completion of the major infrastructure projects under the 'Five-Year Development Plan II'. The empirical evidence of debt sustainability based on estimation results of a standard fiscal reaction function is, however, weak. This implies that, empirically, the responsiveness of fiscal policy in containing increases in government debt is not strongly supported.

Notwithstanding the limitations of debt sustainability frameworks, the assessment underscores the sound macroeconomic and fiscal management that has been associated with robust growth in recent period. However, the main challenge lies in ensuring that debt remains sustainable for the foreseeable future, given the need to scale up development projects to address infrastructure gaps amid dwindling donor financing, changing debt structure, and a fragile global economy that has been hit hard by the COVID-19 pandemic. There is no guarantee that the strong assumptions that underpin the DSA will remain constant. A rapid external debt accumulation, particularly of commercial debt, could expose the country to external vulnerabilities and liquidity pressures relating to debt obligations. Given the rising cost of debt servicing, reliance on commercial debt could be too costly and should be used carefully and selectively, so as not to constrain the scope for enhancing socioeconomic progress in other areas of development. It is vital to leverage on concessional borrowing, coupled with enhanced efficiency of public investment and debt management. There is a need to build capacity for managing an increasingly market-based debt profile and the associated risks, particularly as Tanzania continues to gravitate towards non-concessional sources of credit.

Strategies aimed at increasing domestic resource mobilization are critical. Besides tax reform initiatives, these should include modalities for public–private partnership. The revamping of foreign exchange earnings from the export of goods and services will, besides enhancing the country's ability to service debt, boost economic growth.

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