Received: 25 November 2022 | Revised: 22 March 2023 | Accepted: 2 May 2023

DOI: 10.1111/rsp3.12676

ORIGINAL ARTICLE

The role of COVID-19 in worsening the debt sustainability in developing economies – The case of Ghana and Kenya

Senanu Kwasi Klutse[1] | **Judit Sági**[2] | **Gábor Dávid Kiss**[3]

[1]Noble International Business School, Accra, Ghana

[2]Finance Department, Budapest Business School, University of Applied Sciences, Budapest, Hungary

[3]Institute of Finance and International Economic Relations, University of Szeged, Szeged, Hungary

Correspondence
Judit Sági, Budapest Business School, University of Applied Sciences, Finance Department, Budapest, Hungary.
Email: sagi.judit@uni-bge.hu

Abstract

The SARS-CoV-2 coronavirus pandemic has raised public debt sustainability issues, especially for Heavily Indebted Poor Countries (HIPC). Developing countries with limited fiscal space have had to take on significant external debts to help deal with the negative effects of the pandemic. This has led to further increases in the debt levels of these countries, with the potential to trigger a debt default. Addressing these issues, this study uses a framework for fiscal policy and public debt sustainability analysis. The results confirm the impact of the SARS-CoV-2 coronavirus pandemic on the debt levels of Ghana and Kenya. This study recommends the creation of domestic fiscal buffers and fiscal space toward the attainment of long-term debt sustainability, contrary to the popular view of offering debt relief to these countries.

KEYWORDS
Africa, debt sustainability, fiscal shock, SARS-CoV-2

JEL CLASSIFICATION
H63, I18, H12, N17

1 | INTRODUCTION

Sub-Saharan Africa is still contending with unprecedented health and economic crises. The region, as of December 31, 2020, faced a second coronavirus (COVID-19) wave that swiftly outpaced the scale and speed of the first wave that was experienced between May and July 2020 (Salyer et al., 2021). While this episode has eased, many countries are now bracing for further waves, particularly as access to vaccines remains scant (World Bank, 2021).

The COVID-19 crisis was truly a global shock, affecting both wealthy and poor countries alike. However, the effects were more severe in developing economies in Sub-Saharan Africa that did not have the fiscal space – that is, the capacity to undertake desirable policy initiatives in a medium-term context, such as expanding public capital spending while maintaining a solid fiscal position – to help reduce the negative impact of the pandemic, and had to rely to a greater extent on external sources of funds. Ghana and Kenya are examples of countries that had to resort to external borrowing to help deal with the fiscal effects of the pandemic. The are lower-middle-income countries and moderate performers in the World Bank's Country Policy and Institutional Assessment (CPIA) in Sub-Saharan Africa. The IMF has assessed both countries to be at high risk of debt distress (World Bank, 2021). The COVID-19 pandemic led to a 2.3% of GDP and 5.0% of GDP budget financing gap for Kenya and Ghana, respectively. Additional financing was sourced from the IMF, World Bank, the African Development Bank, and the European Union. Kenya and Ghana also utilized proceeds from Eurobonds issued in 2019 and 2020 to supplement efforts at dealing with the pandemic. With an already high debt-to-GDP ratio (62.1% of GDP for Kenya and 62.9% of GDP for Ghana in 2019), the additional borrowing implies that these countries experienced a worsening of their debt (general government gross debt, public and publicly guaranteed). In addition, for Ghana, the pandemic coincided with the country's general election, which masked the usual expansionary policies that mark this period. Thus, the financing sourced to deal with the pandemic was used for off-COVID-19 expenditures. These factors (a negative shock and a large share of foreign currency debt), according to Asonuma and Ghosh (2016), could trigger a debt default.

To understand the effect of the COVID-19 pandemic on the debt sustainability of developing economies (i.e., Ghana and Kenya), this study uses the IMF's framework for fiscal policy and public debt sustainability analysis (DSA) in market-access countries (MACs) (countries that typically have significant access to international capital markets), and a fully modified ordinary least square (FMOLS) model to determine the impact of the pandemic on the debt sustainability of Ghana and Kenya.

Our results show that most of the increases in external debt in the studied countries are due to reserve build-up or capital outflow rather than a current account deficit or the net incurrence of liabilities of portfolio investments, materializing mainly in the form of equity and investment fund shares. Further to the works of Nguyen and Luong (2021), and Tarek and Ahmed (2013) in investigating the economic implications of fiscal policy and public debt, we emphasize the impact of institutional quality on public debt accumulation by discussing the Country Policy and Institutional Assessment (CPIA) of the study countries. Abbas et al. (2021) also referred to the importance of governmental institutions in accessing the debt sustainability of sovereigns. As recommended for further study by Rajaguru et al. (2021), this study explores the need for fiscal consolidation for developing countries (like Ghana and Kenya) that have had their debt levels worsened by the COVID-19 pandemic. As a contribution to the reviewed literature, we address a challenge with the IMF's framework for fiscal policy and public debt sustainability analysis (DSA) in market-access countries (MACs) by avoiding making projections on the basis of the DSA framework in order not to delay debt restructuring in the study countries.

With the success of the Heavily Indebted Poor Countries (HIPC) initiative in reducing the debt-to-GDP ratios of most developing economies in Sub-Saharan Africa (SSA) in the early 2000s, there have been calls for a similar initiative to be repeated to help these developing countries overcome an imminent debt crisis. The drawback this time is that most of these countries have piled up external commercial debt from private creditors, who constrain any talk of debt forgiveness. With a view to this, the current study recommends fiscal consolidation for both countries, which would ensure efficiency in government spending.

The rest of the paper discusses the relevant literature concerning debt sustainability in the context of an economic crisis. The data and methodology examine the impact of the pandemic on, and potential worsening of, the debt situation in Ghana and Kenya. The results and analysis sections provide perspectives on what might have contributed to the changes in the debt ratio in both Ghana and Kenya. The study concludes by making recommendations.

2 | VULNERABILITY TO EXTERNAL DEBT IN A FOREIGN CURRENCY: GHANA AND KENYA

For Ghana and Kenya, the pandemic is likely to worsen their fiscal outlook and further plunge them into a debt crisis (Hevia & Neumeyer, 2020). El-Khishin and Mohieldin (2020) and Arellano et al. (2020) stressed this fact when they studied external debt vulnerability in emerging markets and developing economies during the COVID-19 pandemic. According to them, emerging markets and developing economies are in a more troubling situation than they were during the global financial crisis, and their current debt is under greater threat from debt architecture and volatile debt forms (primarily foreign-currency-denominated bonds). According to the 2021 International Debt Statistics (IDS) by the World Bank Group, private creditors account for a relatively small share of external public debt for most countries in the world. However, in Ghana, private creditors account for 50% of the external public debt that is denominated in foreign currency (this figure is among the highest in Sub-Saharan Africa, second only to Cote d'Ivoire). In Kenya, private creditors account for 19% of external public debt. The report goes further to state that countries will emerge from the COVID-19 crisis encumbered with a large debt that could take years to manage. El-Khishin and Mohieldin (2020) also warn of an excess demand for credit, which if not handled properly, could worsen their debt crisis, especially because most developing countries' debts have been denominated in foreign currencies. They advised developing countries to maintain stronger financial prudence in the circumstances of growing credit demand.

Ghana and Kenya are examples of developing countries with limited fiscal space (budgetary room to create and allocate funding for a certain purpose without prejudice to debt sustainability) and have had to ask for assistance externally to help them in dealing with the pandemic. In the wake of the crisis in 2020, most Sub-Saharan African countries relied to a greater extent on external funding from multilateral lenders (the International Monetary Fund, IMF, and the World Bank). This has contributed to dropping to a record low in the average yield on emerging-market dollar bonds, according to Bloomberg's Barclays indices. This will usually mean that the capital market is quite favorable for these countries for tapping into the Eurobond market for much-needed funds (Augustin et al., 2021). This has also been occasioned by international investors hunting for yield to buy, not excluding the domestic currency debt of emerging and developing economies. However, there could be constraints in market access in the longer term. Zambia, for example, missed a $42.5 million USD coupon payment on one of its Eurobonds in November 2020, triggering a default after bondholders rejected Zambia's request for a 6-month interest freeze so the country could restructure its debt. This implies that investors will likely pay even more attention to dynamics in other distressed countries within high-yield Sub-Saharan African countries. This situation also indicates that these countries will have to commit to a significant strengthening of their fiscal position to support the demand for a Eurobond issuance. In the scope of this, the need for the mobilization of more domestic revenue will be of key importance. This has to be a priority for Ghana, whose revenue-to-GDP is below the Sub-Saharan African average. However, raising revenue is not an end in itself, but is a way to create fiscal space, an increase in priority spending, and reduced dependence on budget support, which is not without limits (Bahl & Bird, 2008, p. 1). When taxpayers believe their governments are corrupt, they are more likely to evade paying taxes. According to an IMF report, the least corrupt governments collect 4% more of GDP in tax revenues than countries at the same level of economic development with the highest levels of corruption (Gaspar et al., 2019).

Failure to do this will lead to significant credit rating downgrades and capital flight, as is evident in Ghana. A tighter condition in the Eurobond market could lead to lower output and a depreciation of the local currency (Henderson & Prinsloo, 2020). Faster consolidation could help solve the debt problem more quickly, but on the other hand, it could be more counterproductive in terms of reduced output (Stoian, 2010; Sung et al., 2014).

2.1 | Empirical studies

Among other factors, the presence of external debt (denominated in foreign currency) may explain movements in the exchange rate and its impact on an economy. According to Devereux and Lane (2003), external financial liabilities have an important effect on desired bilateral exchange rate volatility for developing economies, above and beyond the standard optimal currency area (OCA) factors. Thus, exchange rate volatility is negatively affected by the stock of external debt. For countries with low international reserves and access to the international capital market, the negative relationship between exchange rate volatility and the stock of external debt can greatly impact government resources. The effect on the financial sector and corporate balance sheets also cannot be overlooked. According to Asonuma and Ghosh (2016), emerging countries experience real exchange rate depreciations around default, and this could occur alongside or as a result of the adoption of a floating exchange rate regime and the implementation of capital market liberalization by most developing economies (Sung et al., 2014).

The difference in short-term interest rates encourages the flow of speculative funds to the country with a higher short-term rate. This provides an incentive for foreign speculative investors to invest in the domestic market. A liberalized capital market will mean that these investors can easily repatriate their funds whenever they sense a risk or discover safer opportunities elsewhere. This act, on a sufficiently large scale, has the potential to magnify the effects of shocks on the economy and further increase exchange rate volatility (Barnhill & Kopits, 2004; Sung et al., 2014).

The Marshall–Lerner condition implies that an exchange rate depreciation can improve the current account balance and hence the balance of payments through increased net exports. Thus, if the sum of demand elasticities for imports and exports is greater than one, Bahmani-Oskooee and Kara (2005) found that developing countries tend to have lower unity price elasticities. In a situation where these developing countries have accumulated significant foreign currency-denominated debt, currency depreciation might negatively impact the economy (Palić et al., 2018).

The 1997 Asian and the 2008 financial crises revealed that foreign capital flows and their effect on exchange rates play an important role in macroeconomic vulnerability. Thus, external borrowing in foreign currency was a major contributing element to these crises. Studies by Eichengreen and Hausmann (1999) and Bordo et al. (2010) support this observation. In fact, as far back as the 1980s, Dornbusch (1984), in a study investigating the debt crisis in Latin America, found that the budget deficits that accommodate terms of trade deterioration and disequilibrium exchange rates are central to a complete explanation of the debt crisis. World crude oil prices, interest rates, and world recession are often isolated as the chief causes of world debt crises. However, these factors may have only made the underlying disequilibrium more apparent, in a way that exchange rate overvaluation and/or budget deficits were perpetuated by excessive recourse to the world capital markets (Combes & Saadi-Sedik, 2006; Dornbusch, 1984).

Asonuma and Ghosh (2016), in studying sovereign defaults, external debt, and real exchange rate dynamics, found that low tradeable goods shocks and a large share of foreign currency debt trigger defaults. The resulting output costs and loss of market access due to default lead to further real exchange rate depreciation. Devereux and Lane (2003), in examining bilateral exchange rate volatility, also found that for developing economies, external financial liabilities have an important effect on desired bilateral exchange rate volatility, above and beyond the standard optimal currency area factors.

Debt build-up does not necessarily match the transfer of resources from the lending partner to the borrower. In developing countries, part of the increased gross debt merely reflects capital flight and may not lead to a change in aggregate net foreign assets. This stems from the fact that the balance of payment account provides a link between the increase in gross external debt and the portfolio and spending decisions of the economy. From some perspectives, the increased gross debt reflects increased borrowing of the inflation component in nominal interest payments (Varga et al., 2019). The transfer of these resources is also constrained by inflation (Combes & Saadi-Sedik, 2006).

Higher public debt is not problematic as long as a higher primary fiscal surplus can be generated to sustain it. The most important issue is whether the current debt exceeds an effective fiscal limit realized at any period (Sung et al., 2014). Kraay and Nehru (2006) highlight the importance of periods in which countries resort to exceptional

finance in any of these three forms, that is, significant arrears on external debt, Paris Club debt rescheduling, and non-concessional IMF lending. Fiscal limits in developing economies are relatively low (Bostan et al., 2018). This is due in part to a low effective tax rate (a combination of low taxes and smaller tax bases), which ultimately leads to lower revenues; weak governance indicators and corruption; and government expenditures growing faster than revenues, usually as a result of political pressures for a major capital formation program.

The deficits that arise from these deteriorations will have to be financed and, in most cases, governments prepare expenditure programs and then attempt to secure their financing from external sources when domestic sources are insufficient. This makes the financing of these deficits dependent on external borrowing. The availability of these external sources of funds can easily create a false sense of fiscal space that leads governments into developing an appetite for large fiscal deficits. The reality, however, is that these sources can be abruptly cut off when the seriousness of the deficits becomes apparent to lenders (Barişik & Baris, 2017; Colombo & Longoni, 2009; Imaginário & Guedes, 2020; Kaufmann et al., 2007; Kim et al., 2017; Klein, 1994).

The situation is further compounded by real exchange rate problems as indicated above. One of the reasons for this is the inability of developing countries to borrow (externally) in their own currencies. This is due to the operation of international financial markets, which prevents countries from borrowing in their own currencies ('original sin'). This in turn leads to a currency mismatch on the country's balance sheet and causes serious macroeconomic and financial problems when the domestic currency depreciates relative to the foreign currency in which the external debt is issued. Whereas Ghana has adopted the inflation targeting (IT) framework, Kenya uses a stabilized arrangement. Many countries in Sub-Saharan Africa belong to a monetary union of some sort; for example, the West African Economic and Monetary Union (WAEMU) or the Economic and Monetary Community of Central Africa (CEMAC). Despite these different exchange rate arrangements, the choice is always going to be between allowing the exchange rate to float freely or not.

One of the frameworks most relied on for accessing the debt sustainability of countries is the Debt Sustainability Analysis (DSA) of the IMF and World Bank. The European Commission also uses a similar framework. The similarity is derived from the fact that the components (debt levels, deficits, and interest rates costs) are linked by universal accounting relationships. Studies (Corsetti, 2018; Guzman & Heymann, 2015) have, however, criticized the use of the DSA, especially the projections of the framework, as being biased and leading to delays in sovereign debt restructuring.

2.2 | The COVID-19 pandemic and its potential to cause a debt crisis

The COVID-19 pandemic is also an economic shock with similar or greater effects such as a low tradeable goods shock. To put this in perspective, Altig et al. (2020), in studying economic uncertainty concerning almost every aspect of the COVID-19 pandemic (implied stock market volatility, newspaper-based policy uncertainty, Twitter chatter about economic uncertainty, subjective uncertainty about business growth, forecaster disagreement about future GDP growth, and a model-based measure of macro uncertainty), noted the lack of close historic parallels of the economic impact of COVID-19 on countries and households. Sági et al. (2020) cite the sudden decline in household purchasing power alongside their climbing indebtedness as a threat to the outlook of businesses. Considering the job losses and contraction in output (GDP) on a quarter-to-quarter basis in developed economies, Altig et al. (2020) stresses the suddenness and enormity of the COVID-19 economic shock. For developing economies in Sub-Saharan Africa, the COVID-19 shock affected them more than in developed countries (Arellano et al., 2020; Bolton et al., 2020).

Most Sub-Saharan African countries swiftly implemented national lockdowns to contain the virus and spare the region from the worst of the crisis. While this saved lives, it dramatically impacted local economies, affecting growth and adding to already high debt levels in Sub-Saharan Africa. Despite this, the impact on economic growth has been contained for Ghana and Kenya. For Kenya, recent data indicate that output growth recovered from −5.5% in the

second quarter of 2020 to −1.1% in the third quarter. For Ghana, output growth recovered from −3.2% in the second quarter of 2020 to −1.1% in the third quarter. Overall provisional growth figures for Ghana show a slightly positive growth of 0.9 propelled by the agricultural sector (i.e., the fisheries subsector). For Kenya, growth in 2020 was −0.3%. Both countries have had their fiscal and debt positions worsened, adding to difficulties (debt distress) that existed even before the COVID-19 shock (see Figure 1).

Dealing with COVID-19 in Sub-Saharan African countries will be especially daunting for the region's fragile health systems in which the difficulty of preparing weak health systems for the outbreak could be compounded by reduced imports due to disruptions in global trade, giving rise to shortages of medical supplies and other goods and resulting in substantial price increases in the future.

Success in containing the virus comes at the price of slowing economic activity, irrespective of whether physical distancing and reduced mobility are voluntary or enforced. The more you implement stricter measures to deal with the pandemic, the more economic activities slow down and then ground to a halt. The only caveat to implementing a successful policy is if a country has enough fiscal or fiscal policy space to cushion those affected by this shock. Thus, the government needs more room or room to expand social spending or public investment (fiscal space); hence, it is constrained in its capacity to run larger deficits in the event of a downturn (fiscal policy space). The absence of fiscal policy or fiscal policy space will mean a country's debt exceeds an effective fiscal limit realized in that period, a common characteristic of developing economies that, according to Klein (1994), have very low fiscal limits, as well as limited fiscal and fiscal policy space. Hills et al. (2021), in studying the determinants of pre-pandemic demand for IMF's Concessional Financing, found that the external debt level, inflation, and real effective exchange rate are the main economic variables influencing concessional borrowing for most eligible countries. Despite these undesirable effects, developing economies can efficiently use borrowing to stimulate aggregate demand and then growth (Afonso & Alves, 2014; Panizza & Presbitero, 2014).

The issue with debt build-up in these developing countries is further compounded by the fact that they have been at the center of recent debt relief efforts such as the Heavily Indebted Poor Countries (HIPC) initiative (Asiedu, 2003; Kraay & Nehru, 2006). As a result, calls for debt forgiveness for debt-distressed developing economies have not received much attention, even with the IMF's decision to make more special drawing rights (SDRs) available to these countries. The appropriate question is how these countries will service or reduce the debts they piled up in 2020 (15% of GDP for Ghana and 6.6% for Kenya) in response to the pandemic without hurting their economies. This has become more apparent as the COVID-19 pandemic shows no sign of slowing down – according to the IMF, in July 2021, Sub-Saharan Africa faced the third wave, with infections reaching more than 210,000 per week. Since the COVID-19 pandemic, as previously described, qualifies as a negative term of trade shock, we premise this study on the observation of Asonuma and Ghosh (2016), who found that low tradeable goods shocks and a large share of foreign currency debt trigger debt defaults. Using Ghana and Kenya as examples, in the next section we investigate the debt dynamics of these countries and how the pandemic has impacted the debt sustainability of these countries while recognizing the challenges of the DSA. This will allow us to recommend an appropriate policy option for these countries by drawing lessons from the HIPC initiative.

3 | DATA AND METHODOLOGY

The study employs a quantitative data analysis method. The data were sourced from the World Bank's development indicators and the International Monetary Fund's World Economic Outlook Database. In addition to these, the Reuters investment data platform provided measures of riskiness regarding the country's access to the capital markets. Besides these, the authors derived data from the individual country's Ministry of Finance database and reports to compensate for the lack of data on the international data platforms. The data are annual data that span from the year 2000 to 2021. The choice of the sample period was determined mainly because of the data availability that did not exist for some of the variables outside these periods. The data variables are defined in Table A1. On the basis of

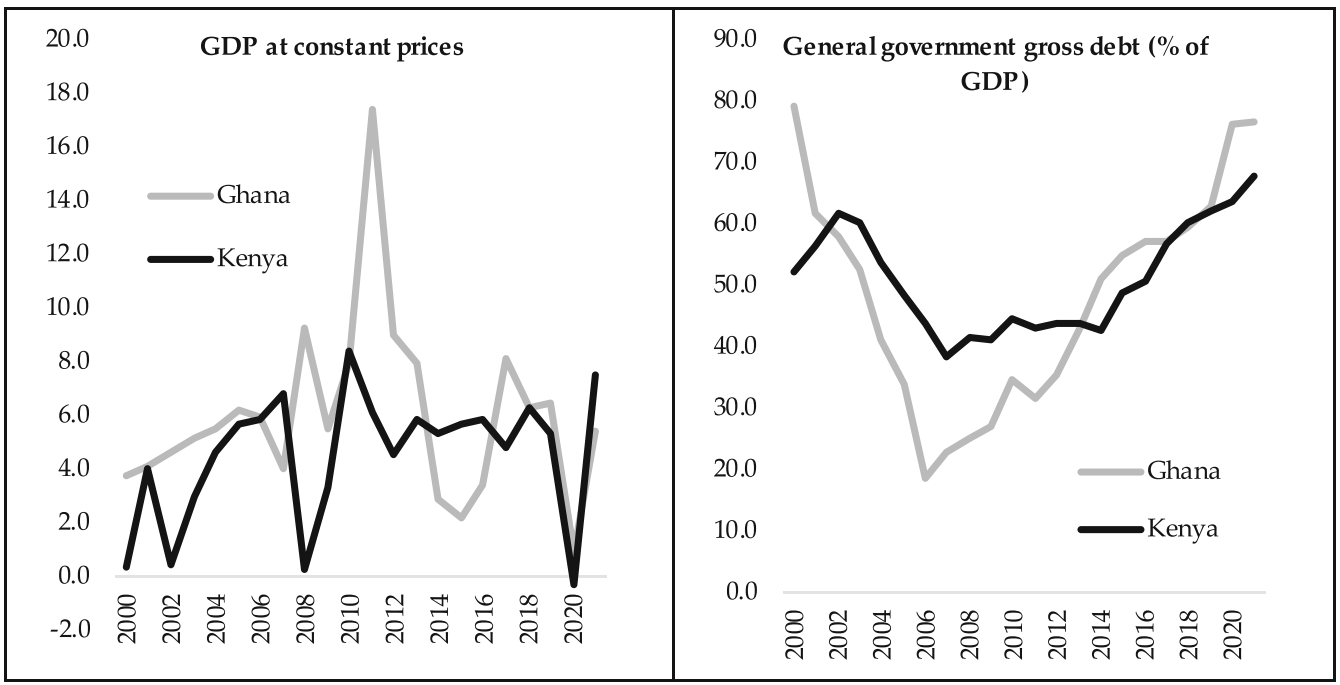

FIGURE 1 Growth and debt trends in Ghana and Kenya.

these datasets, this study employs the market-access country (MAC) debt sustainability analysis (DSA) framework to capture the debt dynamics of Ghana and Kenya. The analysis is derived from the constructs of the balance of payments (as recommended, e.g., by Pellechio & Mathisen, 2006) and the DSA for market-access countries.

To establish a holistic view, we now consider the factors that contribute to the increase in gross public debt. Studies of this phenomenon have used different methods in measuring the relationship between debts, the exchange rate, and other contributing factors. Authors such as Sung et al. (2014) relied on simple least squares regression by employing the generalized autoregressive conditional heteroskedasticity (GARCH) model, and the two-stage least squares estimation methods. Recognizing that exchange rate volatility varies across various periods with increasing trends, Sung et al. (2014) adjusted their volatility measure by estimating a GARCH (1, 1) to deal with the heteroskedasticity problem in the error term. They also used a two-stage least squares estimation method to control for possible reverse causality problems that are related to the short-term debt variable they used. However, the application of their model was mainly to corporations and financial institutions. Asonuma and Ghosh (2016), focusing on emerging economies, also used a two-step generalized method of moment (GMM) estimation to determine default probability using credit ratings on foreign currency debt. This, including other techniques, helped Asonuma and Ghosh (2016) to establish the link between real exchange rate depreciation and default probability around payment defaults. These methods require a longer series of data that is scarce for the sampled countries, and thus makes the estimation of a dynamic model almost impossible.

To effectively measure the relationship between the exchange rate and external debt, the authors in this study rely on the framework for fiscal policy and public debt sustainability analysis (DSA) in market-access countries (MACs). The framework, which was originally developed and employed in 2002 with the purpose of identifying vulnerabilities in the debt structure of the examined countries, was revised by the Executive Board of the IMF in August 2011. The review responded to shortcomings in identifying fiscal vulnerabilities and assessing risks to debt sustainability against the backdrop of increased concerns over fiscal policy and public debt sustainability in many economies (IMF, 2011). The market-access country's (MAC) debt sustainability analysis (DSA) framework is based on an identity characterizing the evolution of the stock of public debt. The framework is shown in Equation (1) below.

$$d_t - d_{t-1} = \frac{1}{\rho_t}\left[d_{t-1} * (i_t - \pi_t * (1 + g_t)) + \varepsilon_t * \left(1 + i_t^f\right) * d_{t-1}^f - d_{t-1} * g_t\right] - pb_t + o_t + res_t \tag{1}$$

where d_t is the gross debt as a percentage of GDP, i_t is the total effective interest rate, π_t is the year-on-year inflation rate, g_t is the growth rate at constant prices, i_t^f is the effective nominal interest rate on foreign currency-denominated debt, d_t^f is the stock of external debt, pb_t is the primary balance, $d_{t-1} * (i_t - \pi_t * (1 + g_t))$ is the contribution of the effective interest rate to the change in gross debt, whereas $\varepsilon_t * \left(1 + i_t^f\right) * d_{t-1}^f$ is the contribution of the exchange rate, $d_{t-1} * g_t$ is the contribution of real GDP growth, and $pb_t + o_t$ is the contribution of the primary balance and other factors to the change in gross debt. res_t is the is a residual variable ensuring that the identity holds. In addition,

$$i_{t+1} = \frac{i_{t+1}^f * d_t^f}{d_t} + \frac{i_{t+1}^d * d_t^d}{d_t} \tag{2}$$

$$\rho_{t+1} = (1 + g_{t+1}) * (1 + \pi_{t+1}) \tag{3}$$

$$\varepsilon_{t+1} = \frac{e_{t+1}}{e_t} - 1 \tag{4}$$

where i_t^d is the effective nominal interest rate on local currency-denominated debt, d_t^d is the stock of local currency-denominated debt, and e_t is the nominal exchange rate. For the purpose of this study, we use a concept of public

debt that differs from the IMF's definition in its Debt Sustainability Analysis (DSA), shown in Equation (5) below. Our concept of debt is derived from the sampled country's government budget analysis. As noted by Dabbicco (2018), there could be differences with what the IMF and the various countries deem the actual debt level should be. As in the case of the sampled countries, they exclude non-government guaranteed external debt contracted by state-owned enterprises (SOEs), which the IMF includes in its analysis. This is because in these countries, the responsibility for external debt recording and payment is divided among different agencies, making debt reporting systematically inconsistent in most cases. Equation (7) adds the other factors to the residual.

$$d_t - d_{t-1} = \frac{1}{\rho_t}\left[d_{t-1} * (i_t - \pi_t * (1 + g_t)) + \varepsilon_t * \left(1 + i_t^f\right) * d_{t-1}^f - d_{t-1} * g_t\right] - pb_t + res_t \tag{5}$$

Following this framework, we identify four sources of changes in gross government debt over the period 2000–2021. These are the effective interest rate (defined as the current-year interest payments divided by previous period debt stock), the nominal effective exchange rate (defined as the nominal conversion rates to USD), real GDP growth, the primary balance (PB) (defined as the overall deficit excluding interest payments), and other residual factors (Res). Some of these variables determine how a country's debt level is evolving both in the short and long term. The higher the level of public debt, the more likely it is that fiscal policy (budget deficit) and public debt are unsustainable. This is because, other things being equal, a higher debt requires a higher primary surplus to sustain it. Moreover, higher debt is usually associated with lower growth and higher interest rates, thus requiring an even higher primary balance to service it (Friedman, 1978, 1985). The exchange rate, if allowed to float normally, depreciates, and therefore we expect the exchange rate depreciation to contribute to increasing the debt ratio. In addition, the primary balance, which is a measure of the fiscal accounts leaving out interest payments, is expected to contribute toward increasing the debt ratio. We expect GDP to put downward pressure on the debt ratio bearing in mind that lower growth would tend to lead to higher debt-to-GDP ratio. The effective interest rate measured adjusts for inflation and the GDP growth factor. This is because countries have been known to inflate their way out of debt and there are instances where the growth in GDP may be higher than the growth in interest rate (Edoun & Motsepe, 2016).

It is worth noting that the DSA prepared by the IMF and the World Bank includes a Country Policy and Institutional Assessment (CPIA), which measures the country's policy and institutional quality in managing its debts and the economy as a whole. On the basis of this measure, both Ghana and Kenya are moderate performers. However, Kenya has a higher score than Ghana and this means that the risks are more tilted toward Ghana. Since 2012, Kenya outperforms Ghana in areas of debt policy, economic management, efficiency of revenue mobilization, equity of public resource use, fiscal policy rating, etc. (see Figure A1). Colombo and Longoni (2009) and Imaginário and Guedes (2020) also found that institutional and sociopolitical variables are one of several factors explaining the level of external debt in developing countries.

Despite this, Guzman and Heymann (2015) raise concerns about the DSA framework as it may provide an international validation of excessive borrowing costs and potential repayment difficulties for countries and the lack of the frameworks for facilitating orderly resolutions of crises. These problems associated with the DSA are limited to the forecast abilities of the framework for which this study is not seeking to evaluate. Moreover, the DSA framework is an identity that is assumed to be true for the variables provided they are properly measured. This assumption may not always be the case in practice. Therefore, there is a need to subject the variables to a regression analysis, whose result will be conditional on the significance of the variables to be used. There are also interactions between some of the variables (the inflation rate and the growth variable). As a result of these interactions and other challenges with the DSA, this study employs the use of an extended fully modified ordinary least square (FMOLS) model used by Phillips and Hansen (1990) to estimate the following equation on the basis of the various contributions to the change in gross debt estimated in Equation (5).

$$\Delta d_t = \alpha_0 + \beta_1 o/w\, Int_t + \beta_2 o/w\, FX_t + \beta_3 o/w\, GDP_t + \beta_4 o/w\, PB_t + \varepsilon_{it} \tag{6}$$

where the change in gross debt as a percentage of GDP (Δd_t) is dependent on the contribution from the interest payments ($o/w\,Int_t$), the exchange rate ($o/w\,FX_t$), the GDP ($o/w\,GDP_t$) and the primary fiscal balance ($o/w\,PB_t$).

The extension was motivated by the works of Phillips and Moon (1999), Pedroni (2001), and Kao and Chiang (2001). The FMOLS was used to eliminate the problems caused by long-run correlations between cointegrating equations and stochastic regressors innovations. The FMOLS estimator is given by Equation (7) below.

$$\widehat{\theta} = \left[\sum_{i=1}^{N}\sum_{t=1}^{T} Z_{it}Z_{it}'\right]^{-1}\sum_{i=1}^{N}\sum_{t=1}^{T}\left(Z_{it}\widehat{Y}_{it}^{+} - \widehat{\lambda}_{12}^{+'}\right) \tag{7}$$

where Z is a function of the independent variables and the deterministic trend. Given estimates of the average long-run covariances, $\widehat{\lambda}$ and $\widehat{\Omega}$, the modified dependent variable and serial correlation correction terms are defined in Equations (8) and (9) below.

$$\widehat{Y}_{it}^{+} = \widehat{Y}_{it} - \widehat{w}_{12}\Omega_{22}^{-1}\widehat{\mu}_2 \tag{8}$$

$$\widehat{\lambda}_{12}^{+} = \widehat{\lambda}_{12} - \widehat{w}_{12}\Omega_{22}^{-1}\widehat{\lambda}_2 \tag{9}$$

where Y_{it} and X_{it} are the corresponding data (dependent and independent variables) purged of the individual deterministic trends, and $\widehat{w}_{12}$ is the long-run average variance of μ_{1it} conditional on μ_{2it}. Y_{it} and X_{it} are also the demeaned variables in the leading case of individual specific intercepts. As a result of the use of FMOLS model, the sample was adjusted to 2002–2020.

The COVID-19 pandemic is recent and any attempt to overextend the data series may also distort analysis of the phenomena (Faber & Fonseca, 2014). Therefore, the study will mainly rely on the results from the DSA and FMOLS models as shown in Equations (5) and (6).

4 | RESULTS AND DISCUSSIONS

The framework for fiscal policy and public debt sustainability analysis used in this study concludes that on average the exchange rate is the major contributor to the increase in the change in gross debt followed by the primary balance in Ghana from 2000 to 2021. However, in Kenya, the primary balance came out as the major contributor to the increase in the change in the gross debt followed by the exchange rate over the period 2000–2021. Over the same period, the interest rate and GDP growth contributed to a decreasing pressure on the change in gross debt in both Ghana and Kenya (Table 1). This result is true if the identity of the DSA is true for all variables.

If we assume that the DSA of the study countries is only true if it is conditional on the independent variables, then the FMOLS regression result shows that a 1.438 change in the exchange rate leads to a significant unit change in the change in the gross debt in Ghana. In addition, a 1.822 change in the effective interest rate leads to a significant unit change in the gross debt. The other variables were not significant in determining the changes in the gross debt in Ghana. However, In Kenya, a unit increase in the change of the gross debt leads to a 2.509 increase in the GDP. A 2.468 increase in the primary balance also leads to a significant unit increase in the gross debt. The other variables were not significant in determining changes in gross debt in Kenya (see Table 2). The results from Table 2 will have to be applied with care due to the small sample size, which suits the recent nature of the phenomenon (COVID-19) being studied.

TABLE 1 Contributions to changes in the gross debt in Ghana and Kenya (2000–2020) in percentage of GDP.

	Ghana 2000–2021	Kenya 2000–2021
Δd	0.9	0.6
o/w Int.	−2.5	−0.3
o/w FX	3.6	0.4
o/w GDP	−2.2	−2.0
o/w PB	2.4	2.1
o/w Res	−0.3	0.4

Source: Author creation.

TABLE 2 Regression output for the change in gross debt as a percentage of GDP.

Independent Variable	Ghana			Kenya		
	Coefficient	*t*-Statistic	Prob.	Coefficient	*t*-Statistic	Prob.
O_W_FX	1.438	3.009	0.009	0.289	0.463	0.650
O_W_GDP	1.418	1.499	0.155	2.160	2.509	0.024
O_W_INT_	1.822	5.172	0.000	0.378	0.837	0.416
O_W_PB	0.696	1.505	0.153	0.889	2.468	0.026
C	2.199	0.629	0.539	3.254	1.661	0.118
R-squared	0.676			0.516		
Adjusted *R*-squared	0.589			0.387		
Jarque–Bera	4.929			1.667		
Probability	0.085			0.435		

Source: Author creation.

The diagnostic tests showed that the residuals were normally distributed and not correlated. A group unit root test rejected the presence of a unit root in the variables. This was the case for the FMOLS models estimated for Ghana and Kenya.

To further understand the dynamics, this study breaks the study period into three sections (2000–2006 to evaluate the contributions to the change in the gross debt during the HIPC initiative, 2007–2013 to evaluate periods before the commodity crisis in 2014, and 2014–2021to evaluate periods after the commodity shock in 2014) and then analyses 2020 separately to highlight the significance of the pandemic (Table 3). The analysis shows that from 2000 to 2006, both Ghana and Kenya witnessed a fall in the change in the gross debt fueled by the effective interest rate and the GDP growth. This result confirms the HIPC initiative's effect on countries' debt levels. The initiative, as has been widely reported, led to debt forgiveness, which saw Ghana's gross debt reduce to 18.6% of GDP in 2006 from 79.2% of GDP in 2000. Kenya's gross debt to GDP also reduced from 52.2% of GDP to 44.0% of GDP over the same period. This evidence forms the basis for advocates pushing for a similar package for developing countries after the pandemic hit in 2020.

After witnessing a substantial decline in the debt levels from 2000 to 2006 (as presented in Table 3, Ghana and Kenya witnessed changes in their gross debt of −5.3% and −1.4% of GDP. In the aftermath of the HIPC initiative, Ghana especially embarked on a borrowing spree, this time involving more private investors (via Eurobonds). This is confirmed by a positive change in the gross debt for both Ghana and Kenya from 2007 to 2013 and from 2014 to

TABLE 3 Contributions to changes in the gross debt in Ghana and Kenya (2000–2020), by subperiods.

	Ghana				Kenya			
Variable	2000–2006	2007–2013	2014–2021	2020	2000–2006	2007–2013	2014–2021	2020
Δd	−5.3	3.5	4.2	13.3	−1.4	0.0	3.0	1.6
o/w Int.	−6.6	−0.4	−0.9	0.1	−0.8	−1.0	0.8	1.0
o/w FX	6.2	1.5	3.2	1.3	−0.1	0.6	0.7	1.6
o/w GDP	−2.1	−2.1	−2.2	−0.5	−1.7	−1.9	−2.4	0.2
o/w PB	0.7	4.5	2.0	7.4	−0.7	2.3	4.4	3.4
o/w Res	−3.5	0.0	−0.5	5.1	1.8	0.0	−0.5	−4.6

Source: Author creation.

2021 (see Table 3). This policy shift has been promoted by the adequacy of and/or the cost of conditionalities attached to aid for developing countries, who need a consistent flow of funds for their growth and developmental agenda. Despite this, grants and aid unquestionably provide more fiscal space than borrowing. The apparent source of funds to finance these funding gaps in developing countries did not matter to Ghana's policy advisors after the HIPC initiative's completion in 2006. Access to international capital market financing was (and still is) seen as an opportunity for these countries to pursue their development priorities without the usual donor conditionalities.

Notwithstanding that, the capital markets are probably more ruthless in punishing bad policies than donor institutions. There was also the argument that when one priced in the delays involved in accessing donor funds and the conditionality attached, the actual price of aid funds was not concessional (Bawumia, 2010, p. 168). With this policy shift, the decreasing effect of the effective interest rate started to reduce as interest cost increased in these countries, especially from 2014 to 2021, with 2020 being the driver (see Table 3). Without the supervisory role of the Bretton Woods institutions, the primary balance, as presented in Table 4, started exerting increasing pressure on the change in the gross debt from 2007 to 2013. Kenya was more cautious with its borrowings over the 2007–2013 period. From 2014 to 2021, the situation worsened, with the COVID-19 pandemic arguably playing a significant role. There was a considerable change in the gross debt over this period, as presented in Table 3 (4.2% of GDP for Ghana and 3.0% of GDP for Kenya).

For Ghana, the exchange rate and the primary balance were the main reasons for the increase in the change in the debt ratio. For Kenya, in comparison, the effective interest rate, the exchange rate, and the primary balance were the main causes of similar trends in the gross debt. This complements the findings of Eichengreen and Hausmann (1999) and Bordo et al. (2010) that external borrowing in foreign currency is a major reason behind public debt problems. In 2020, almost all the indicators contributed to increasing the gross debt ratio, confirming the observations of Altig et al. (2020), Arellano et al. (2020), and Bolton et al. (2020) regarding the negative impact of the COVID-19 pandemic on developing economies. The change in the gross debt in 2020 was 13.3% of GDP and 1.6% of GDP for Ghana and Kenya, respectively. For both Ghana and Kenya, the effective interest rate contributed positively to the increase in the change of gross debt. The primary balance was the main contributor to the increase in the debt ratio in 2020 for both Ghana and Kenya. The residual, which may also be a pointer to arrears accumulation, played a critical role in the increase in gross debt in Ghana as well. The 2020 outcome means that these countries cannot continue to pile up expensive debts. The situation is worse if we compare the ratio of the interest cost to tax revenue for these countries. The ratio is now 51% and 35% for Ghana and Kenya, respectively (Figure 2). Ghana's quest to embark upon liability management since 2015 does not appear to be working, as the debt ratio to GDP also keeps rising.

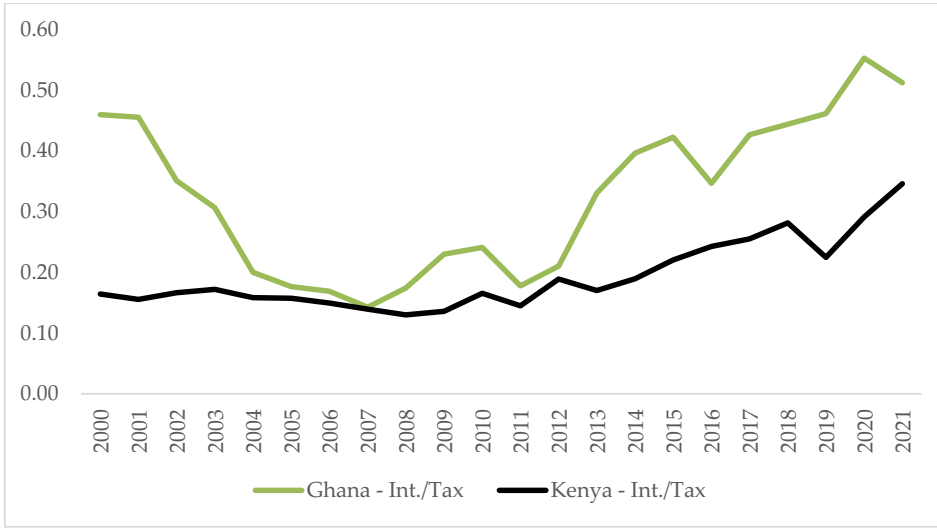

FIGURE 2 Interest rate to tax revenue ratio in Ghana and Kenya (2000–2021). *Source*: Author creation

5 | CONCLUSIONS

This study aimed to investigate how the COVID-19 pandemic worsened the debt sustainability of Ghana and Kenya. The literature review leads to the conclusion that Ghana and Kenya had limited fiscal space before the pandemic hit the continent in 2020. These countries were also judged to be in debt distress before and during the pandemic, with private creditors holding significant portions of external debts in these countries. According to the reviewed literature (low tradeable goods shock and a large percentage of foreign currency debt), this triggers a debt default. In Ghana's case, efforts to deal with the pandemic coincided with the elections and the usual expansionary policy that characterizes this period was masked by efforts to deal with the pandemic. Thus, according to the auditor general's report of COVID-19 expenditures, most of the funds secured to help deal with the pandemic in 2020 were spent on non-COVID-19-related expenditures, such as additional energy and financial sector costs and higher interest payments (domestic borrowing).

The results show that the pandemic has worsened the debt sustainability of the developing economies of Ghana and Kenya. Using the IMF's framework for fiscal policy and public DSA in market-access countries (MACs) and a FMOLS model, the results showed that both Ghana and Kenya added 13.3% of GDP and 1.6% of GDP, respectively, to their gross debt in 2020 alone. The results also showed that the primary fiscal balance was a major contributor to the increase in the gross debt, followed by the exchange rate. This debt overhang may slow investment and growth for years to come.

The path to recovery is going to be very complex and challenging, especially when these countries need the fiscal space to bring down debt levels naturally. There have been significant calls for debt forgiveness as developing countries face debt sustainability problems. The IMF and the World Bank have called for a Debt Service Suspension Initiative (DSSI) and have made more SDRs available to member countries. However, the solution of debt relief is difficult to implement, mainly because of significant reliance on private funding sources. During the HIPC initiative, multilateral and bilateral donors held a chunk of these countries' debt, making debt relief possible. The challenge now is that it will take a lot of work to bring private creditors onboard for any talk of debt relief, judging from the experiences of Argentina and Ecuador. China – Ghana's biggest creditor – is not supportive of setting up a creditors' committee to agree on an aid package for Ghana. The problem of debt transparency and collateralized debt (debt with

collateral-like features) that appears to be prevalent in developing countries cannot be overlooked in this regard (Georgieva et al., 2020). With capital market access, Ghana and Kenya did not participate in the DSSI due to concerns over future access and credit-rating downgrades by rating agencies. Ghana is now seeking debt treatment under the DSSI after rating agencies have rated the country's debt as a selective default.

In an attempt to recover from the shock posed by the pandemic, Kenya has sought assistance from the IMF in the next phase of the country's COVID-19 response and a solid multi-year effort to stabilize and begin reducing debt levels relative to GDP. Conversely, Ghana is implementing a home-grown policy of some sort with the same purpose of economic recovery. As of July 1, 2022, Ghana had reneged on its earlier position and is requesting assistance from the IMF. The fact is that Kenya's program with the IMF is likely to bring on board other development partners who see the IMF as an institution of restraint and provider of the needed credibility that will guarantee efficient use of resources. Without this type of assistance, Ghana will have to borrow from the capital market (which is shut to Ghana due to recent credit ratings downgrades) and aggressively cut spending on investment and social programs, making it more difficult for Ghana to achieve a durable and an inclusive recovery. Despite the different paths to recovery being implemented by these countries, the impact of fiscal consolidation for both countries would need to be softened by more efficient spending—ensuring that government spending is channeled to areas where it is most needed. This should be guided by the need to create fiscal buffers domestically to ensure the fulfilment of future debt service obligations. The mistakes of the past in which developing countries are assured debt forgiveness and access to external funds unabated should not be repeated. To build durable economic recoveries in these countries, the focus should be on creating domestic fiscal buffers (savings) and fiscal space. This will ultimately lead to a reduction in the debt levels and reduce excessive borrowing.

Our inability to verify whether the study countries had reported the true state of their debts to the IMF presents a limitation to this study. An avenue for further research will be to investigate how developing countries can effectively restructure their debts without disrupting their financial sectors.

DATA AVAILABILITY STATEMENT

Data for the study are available at IMF Data Home Page - Data Topic - IMF Data (accessed on 1 September 2021).

ORCID

Judit Sági https://orcid.org/0000-0003-4197-3530

REFERENCES

Abbas, Q., Junqing, L., Ramzan, M., & Fatima, S. (2021). Role of governance in debt-growth relationship: Evidence from panel data estimations. *Sustainability*, *13*(11), 5954. https://doi.org/10.3390/su13115954

Afonso, A., & Alves, J. (2014). The role of government debt in economic growth (ISEG-UTL economics department working paper no. 16/2014/DE/UECE). https://doi.org/10.2139/ssrn.2468805

Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., Davis, S. J., Leather, J., Meyer, B., Mihaylov, E., & Mizen, P. (2020). Economic uncertainty before and during the COVID-19 pandemic. *Journal of Public Economics*, *191*, 104274. https://doi.org/10.1016/j.jpubeco.2020.104274

Arellano, C., Bai, Y., & Mihalache, G. P. (2020). Deadly debt crises: COVID-19 in emerging markets (No. w27275). National Bureau of Economic Research.

Asiedu, E. (2003). Debt relief and institutional reform: A focus on heavily indebted poor countries. *The Quarterly Review of Economics and Finance*, *43*, 614–626. https://doi.org/10.1016/S1062-9769(03)00038-3

Asonuma, T., & Ghosh, A. R. (2016). Sovereign defaults, external debt, and real exchange rate dynamics. *IMF Working Papers*, *2016*(37), 1. https://doi.org/10.5089/9781475597738.001

Augustin, P., Sokolovski, V., Subrahmanyam, M. G., & Tomio, D. (2021). In sickness and in debt: The COVID-19 impact on sovereign credit risk. *Journal of Financial Economics*, *143*, 1251–1274. https://doi.org/10.2139/ssrn.3613432

Bahl, R. W., & Bird, R. M. (2008). Tax policy in developing countries: Looking back—And forward. *National Tax Journal*, *61*(2), 279–301. https://doi.org/10.17310/ntj.2008.2.06

Bahmani-Oskooee, M., & Kara, O. (2005). Income and price elasticities of trade: Some new estimates. *The International Trade Journal*, *19*(2), 165–178. https://doi.org/10.1080/08853900590933125

Barişik, S., & Baris, A. (2017). Impact of governance on budget deficit in developing countries. *Theoretical and Applied Economics*, *24*(2 [611]), 111–130. http://www.ectap.ro/impact-of-governance-on-budgetdeficitin-developing-countries-salih-barisik_abdullah-baris/a1272/ (Accessed on October 14, 2021).

Barnhill, T. M., & Kopits, G. (2004). Assessing fiscal sustainability under uncertainty. *The Journal of Risk*, *6*, 31–53. https://doi.org/10.21314/JOR.2004.096

Bawumia, M. (2010). *Monetary policy and financial sector reforms in Africa: Ghana's experience*. Combert Impressions Ghana Ltd.

Bolton, P., Buchheit, L. C., Gourinchas, P. O., Gulati, G. M., Hsieh, C. T., Panizza, U., & Weder di Mauro, B. (2020). *Born out of necessity: A debt standstill for COVID-19*. Center for Economic Policy Research.

Bordo, M. D., Meissner, C. M., & Stuckler, D. (2010). Foreign currency debt, financial crises and economic growth: A long-run view. *Journal of International Money and Finance*, *29*(4), 642–665. https://doi.org/10.1016/j.jimonfin.2010.01.002

Bostan, I., Toderaşcu, C., & Gavriluţă, A. F. (2018). Challenges and vulnerabilities on public finance sustainability. A Romanian case study. *Journal of Risk and Financial Management*, *11*, 55. https://doi.org/10.3390/jrfm11030055

Colombo, E., & Longoni, E. (2009). The politics of external debt in developing countries (working paper no. 176, University of Milano-Bicocca, Department of Economics). https://econpapers.repec.org/paper/mibwpaper/176.htm (Accessed on October 14, 2021).

Combes, J. L., & Saadi-Sedik, T. (2006). How does trade openness influence budget deficits in developing countries? *Journal of Development Studies*, *42*(8), 1401–1416. https://doi.org/10.1080/00220380600930762

Corsetti, G. (2018). *Debt sustainability assessments: The state of the art*. European Parliament.

Dabbicco, G. (2018). A comparison of debt measures in fiscal statistics and public sector financial statements. *Public Money & Management*, *38*(7), 511–518. https://doi.org/10.1080/09540962.2018.1527543

Devereux, M. B., & Lane, P. R. (2003). Understanding bilateral exchange rate volatility. *Journal of International Economics*, *60*(1), 109–132. https://doi.org/10.1016/S0022-1996(02)00061-2

Dornbusch, R. (1984). External debt, budget deficits and disequilibrium exchange rates (No. w1336). National Bureau of Economic Research.

Edoun, E. I., & Motsepe, D. (2016). Critical assessment of highly indebted poor countries (HIPIC) initiative in Africa and the implication of the new Partnership for Africa's development (NEPAD) (2001–2016): A theoretical perspective. *Investment Management and Financial Innovations*, *13*(3), 380–386. https://doi.org/10.21511/imfi.13(3-2).2016.10

Eichengreen, B., & Hausmann, R. (1999). Exchange rates and financial fragility (No. w7418). National Bureau of Economic Research.

El-Khishin, S. & Mohieldin, M. (2020). November. External debt vulnerability in emerging markets and developing economies during the Covid-19 shock. In Economic Research Forum Working Papers (No. 1413).

Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, *19*(4), 27–29. https://doi.org/10.1590/2176-9451.19.4.027-029.ebo

Friedman, B. (1978). Crowding Out or Crowding In? The Economic Consequences of Financing Government Deficits. National Bureau of Economic Research, Working Paper 284, Cambridge. https://doi.org/10.3386/w0284

Friedman, B. (1985). Crowding Out or Crowding In? Evidence on Debt-Equity Substitutability. NBER Working Paper Series, 1565, Cambridge. https://doi.org/10.3386/w1565

Gaspar, V., Mauro, P., & Medas, P. (2019). Tackling corruption in government. https://www.imf.org/en/Blogs/Articles/2019/04/04/blog-fm-ch2-tackling-corruption-in-government

Georgieva, K., Pazarbasioglu, C., & Weeks-Brown, R. (2020). Reform of the international debt architecture is urgently needed. Accessed on 20/04/2021. IMF blog. https://blogs.imf.org/2020/10/01/reform-of-the-international-debt-architecture-is-urgently-needed/

Guzman, M., & Heymann, D. (2015). The IMF debt sustainability analysis: Issues and problems. *Journal of Globalization and Development*, *6*(2), 387–404. https://doi.org/10.1515/jgd-2015-0034

Henderson, R., & Prinsloo, L. (2020). African Eurobonds set for 2021 comeback after missing rush. https://www.bloomberg.com/news/articles/2020-11-19/absence-may-make-eurobond-investors-fonder-of-african-issuers

Hevia, C., & Neumeyer, P. A. (2020). A perfect storm: COVID-19 in emerging economies. *Covid-19 in Developing Economies*, *1*(1), 25–37.

Hills, T., Nguyen, H., & Sab, R. (2021). Determinants of pre-pandemic demand for the IMF's concessional financing (No. 2021/015). International Monetary Fund.

Imaginário, J., & Guedes, M. J. (2020). Governance and government debt. *Risk Governance and Control: Financial Markets & Institutions*, *10*(3), 34–49. https://doi.org/10.22495/rgcv10i3p3

IMF. (2011). Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis. Accessed on 14/10/2021. https://www.imf.org/external/np/pp/eng/2011/080511.pdf

Kao, C., & Chiang, M. H. (2001). On the estimation and inference of a cointegrated regression in panel data. In *Nonstationary panels, panel cointegration, and dynamic panels* (pp. 179–222). Emerald Group Publishing Limited.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2007). Governance matters VI: Aggregate and individual governance indicators for 1996-2006 (the World Bank policy research working paper no. 4280). http://info.worldbank.org/governance/wgi/pdf/govmatters6.pdf (Accessed on October 14, 2021).

Kim, E., Ha, Y., & Kim, S. (2017). Public debt, corruption and sustainable economic growth. *Sustainability*, *9*(3), 1–30. https://doi.org/10.3390/su9030433

Klein, T. M. (1994). *External debt management: An introduction* (Vol. 23). World Bank Publications.

Kraay, A., & Nehru, V. (2006). When is external debt sustainable? *The World Bank Economic Review*, *20*(3), 341–365. https://doi.org/10.1093/wber/lhl006

Nguyen, T. A. N., & Luong, T. T. H. (2021). Fiscal policy, institutional quality, and public debt: Evidence from transition countries. *Sustainability*, *13*(19), 10706. https://doi.org/10.3390/su131910706

Palić, I., Banić, F., & Matić, L. (2018). The analysis of the impact of depreciation on external debt in long run: Evidence from Croatia. *Interdisciplinary Description of Complex Systems: INDECS*, *16*(1), 186–193. https://doi.org/10.7906/indecs.16.1.15

Panizza, U., & Presbitero, A. F. (2014). Public debt and economic growth: Is there a causal effect? *Journal of Macroeconomics*, *41*, 21–41. https://doi.org/10.1016/j.jmacro.2014.03.009

Pedroni, P. (2001). Fully modified OLS for heterogeneous cointegrated panels. In *Nonstationary panels, panel cointegration, and dynamic panels* (pp. 93–130). Emerald Group Publishing Limited.

Pellechio, A., & Mathisen, J. (2006). Using the balance sheet approach in surveillance: Framework, data sources, and data availability. IMF working paper no. 06/100. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Using-the-Balance-Sheet-Approach-in-Surveillance-Framework-Data-Sources-and-Data-Availability-19132 (Accessed on October 14, 2021).

Phillips, P. C., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I (1) processes. *The Review of Economic Studies*, *57*(1), 99–125. https://doi.org/10.2307/2297545

Phillips, P. C., & Moon, H. R. (1999). Linear regression limit theory for nonstationary panel data. *Econometrica*, *67*(5), 1057–1111. https://doi.org/10.1111/1468-0262.00070

Rajaguru, G., Khan, S. U., & Rahman, H. U. (2021). Analysis of Australia's fiscal vulnerability to crisis. *Journal of Risk and Financial Management*, *14*(7), 297. https://doi.org/10.3390/jrfm14070297

Sági, J., Chandler, N., & Lentner, C. (2020). Family businesses and predictability of financial strength: A Hungarian study. *Problems and Perspectives in Management*, *18*(2), 476–489. https://doi.org/10.21511/ppm.18(2).2020.39

Salyer, S. J., Maeda, J., Sembuche, S., Kebede, Y., Tshangela, A., Moussif, M., Ihekweazu, C., Mayet, N., Abate, E., Ouma, A. O., & Nkengasong, J. (2021). The first and second waves of the COVID-19 pandemic in Africa: A cross-sectional study. *The Lancet*, *397*(10281), 1265–1275. https://doi.org/10.1016/S0140-6736(21)00632-2

Stoian, A. (2010). Fiscal vulnerability vs. fiscal sustainability: Theoretical background. *Theoretical and Applied Economics*, *5*, 541–554.

Sung, T., Park, D., & Park, K. Y. (2014). Short-term external debt and foreign exchange rate volatility in emerging economies: Evidence from the Korea market. *Emerging Markets Finance and Trade*, *50*(sup6), 138–157. https://doi.org/10.1080/1540496X.2014.1013854

Tarek, B. A., & Ahmed, Z. (2013). Governance and economic performance in developing countries: An empirical study. *Journal of Economics Studies and Research*, *2013*, 390231. https://doi.org/10.5171/2013.390231

Varga, J., Temuulen, E., & Bareith, T. (2019). An empirical analysis of the relationship between economic growth and credit volumes in Hungary. *Public Finance Quarterly*, *64*(4), 483–498. https://doi.org/10.35551/PFQ_2019_4_1

World Bank. (2021). *International debt statistics 2021*. World Bank. https://doi.org/10.1596/978-1-4648-1610-9

How to cite this article: Klutse, S. K., Sági, J., & Kiss, G. D. (2023). The role of COVID-19 in worsening the debt sustainability in developing economies – The case of Ghana and Kenya. *Regional Science Policy & Practice*, *15*(6), 1259–1275. https://doi.org/10.1111/rsp3.12676

APPENDIX A

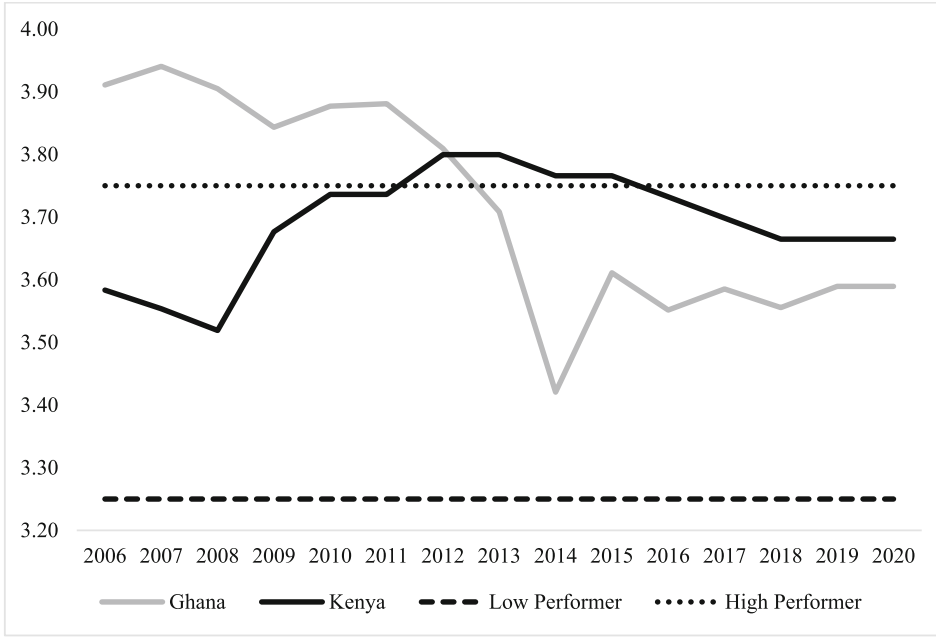

FIGURE A1 CPIA scores for Ghana and Kenya (2006–2020). *Source*: World Bank Group, CPIA database (http://www.worldbank.org/ida).

TABLE A1 Variables and their definitions.

Variables	Definition
Gross domestic product, constant prices	Percent change; year-on-year changes and the base year are country specific
Inflation, end of period consumer prices	Percent change; year-on-year changes and the base year are country specific
General government primary net lending/borrowing	Percent of GDP; net lending/borrowing plus net interest payable
General government gross debt; public and publicly guaranteed	Percent of GDP; all liabilities that require payments of interest by the debtor to the creditor at a future date
External debt stocks, public and publicly guaranteed (PPG) (DOD, current US$)	Percent of GDP
Exchange Rates, national currency per US dollar, end of period, rate	
Portfolio investment, liabilities	Millions of US dollars
Current account (excludes reserves and related items)	Millions of US dollars
Interest payments	Millions of domestic currency

DOI: 10.1111/rsp3.12676

Resumen. La pandemia de coronavirus SARS-CoV-2 ha planteado problemas de sostenibilidad de la deuda pública, especialmente para los Países Pobres Muy Endeudados (PPME). Los países en desarrollo con un espacio fiscal limitado han tenido que contraer importantes deudas externas para ayudar a hacer frente a los efectos negativos de la pandemia. Esto ha dado lugar a nuevos aumentos de los niveles de deuda de estos países, con el potencial de desencadenar un impago de la deuda. Para abordar estas cuestiones, este estudio utiliza un marco para el análisis de la política fiscal y la sostenibilidad de la deuda pública. Los resultados confirman el impacto de la pandemia de coronavirus SARS-CoV-2 en los niveles de deuda de Ghana y Kenia. Este estudio recomienda la creación de amortiguadores fiscales domésticos y espacios fiscales para lograr la sostenibilidad de la deuda a largo plazo, contrariamente a la opinión popular de ofrecer un alivio de la deuda a estos países.

抄録: 新型コロナウイルスのパンデミックは、重債務貧困国を中心に、公的債務の持続可能性の問題を提起した。財政余力がない発展途上国は、パンデミックの悪影響に対処するために多額の対外債務を引き受けなければならなかった。これにより、債務レベルはさらに引き上げられ、債務不履行を引き起こす可能性がある。この問題に対処するため、本研究では財政政策と公的債務の持続可能性の分析の枠組みを使用した。結果から、新型コロナウイルスのパンデミックがケニヤの債務レベルに与えた影響が確認された。結果から、これらの国に債務救済を提供するという一般的な見方とは異なり、長期的な債務の持続可能性の達成のために国内の財政バッファーと財政余力を構築することが推奨される。