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Fiscal Effects of the COVID-19 Pandemic: Assessing Public Debt Sustainability in the Philippines

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Abstract

This paper examines whether the current level of debt in the country, given the national government's fiscal policy and plans, remains on a sustainable path. By end-2021, a year after the peak of the public health and economic crisis brought about by the COVID-19 pandemic, the country's debt-to-GDP ratio had already climbed to 60.5 percent, over 20 percentage points above pre-pandemic levels and slightly above the government's indicative cap. Several empirical exercises were performed in this paper to investigate the country's fiscal solvency, namely by: (1) providing a historical decomposition of public debt, (2) tracking the evolution of the debt-to-GDP ratio in the next half-decade through standard debt sustainability analysis (DSA), (3) computation of the fiscal gap to shed light on the fiscal adjustment needed to bring the country to more comfortable debt levels, and (4) estimation of fiscal reaction functions for the Philippines and developing ASEAN-5 economies to see how fiscal policy will likely respond to debt and other relevant macroeconomic conditions. Results suggest that the country's debt position today is less worrisome than it had been during previous debt crises, and that the debt-to-GDP ratio will remain manageable despite peaking above 65 percent over the next couple of years. Given the need to spend to prevent possible scarring from the pandemic and give the economy time as well as room to recover from the pandemic crisis, it may not be feasible to immediately return to pre-COVID-19 debt ratios, based on fiscal gap computations. This underscores the need for a sound medium- to long-term fiscal consolidation plan to anchor sentiments. Fiscal reaction functions for the Philippines and similar economies in the region meanwhile indicate responsible fiscal policy that guarantees fiscal solvency. This presupposes however the absence of major fiscal policy reversals, especially of hard-won fiscal reforms since the mid-1980s.

Keywords: government debt, debt sustainability, fiscal gap, fiscal reaction function

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1. Introduction

The COVID-19 pandemic presented a huge shock to economies all over the world, with governments simultaneously seeking to soften the impact of the public health crisis through greater social and stimulus spending and expansionary monetary policy. In the Philippines, the fiscal response of government had essentially been through two fiscal packages and corporate tax cuts. The immediate effect of the pandemic on fiscal performance had been a collapse of revenues due to a shrinking economy, an inevitable widening of the fiscal deficit as the revenue drop coincided with accelerated spending, and ultimately a sharp accumulation of public debt. From just 39.6 percent in 2019, the national government debt-to-GDP ratio grew to 54.5 percent in 2020, and now stands at 60.5 percent (in 2021).

The role of government, however, is to continue managing the impact of the pandemic crisis, and this may require further spending in the years ahead. The alternative may be the now repeatedly cited long-run risk to growth—i.e., the "scarring effect" of COVID-19, referring to possible damage caused by the public health disturbance to the country's supply potential (mainly its workers and businesses). The question that naturally arises is whether there is fiscal space left for more spending. The alternative question would be whether the national government's current level of debt, given its fiscal policy and plans, remains on a sustainable path.

The latter question is what this paper aims to answer. It begins by examining the immediate impact of the COVID-19 pandemic and related fiscal policy responses on the Philippines' public finances and by providing a broader (historical) frame for assessing the recent run-up in public debt. This analysis is followed by a set of empirical exercises that help determine how the public debt-to-GDP ratio will likely evolve in the next half-decade, the fiscal adjustments needed to bring debt to more comfortable levels under different time frames, and how fiscal policy will likely respond to debt and other relevant macroeconomic conditions. Specifically, we follow the debt sustainability analysis (DSA) framework outlined in IMF (2013) to compute for the country's medium-term debt trajectory based on combined macroeconomic assumptions and forecasts of government and private sector institutions; and the fiscal gap framework of Auerbach (1994, 2020) to calculate the primary balance adjustments needed to bring the debt ratio back to pre-pandemic levels. We also estimate fiscal reaction functions in the spirit of Bohn (1998, 2008) for the Philippines and ASEAN-5 economies to help assess fiscal sustainability by providing a perspective on the probable path of primary balances based on governments' past behavior.

This paper is organized as follows. Section 2 examines the immediate fiscal impact of the pandemic crisis in the Philippines, provides a historical decomposition of national government debt, then summarizes the post-COVID-19 fiscal outlook of both government and private sector forecasters. Section 3 computes the medium-term trajectory of the country's debt-to-GDP ratio based on this outlook using a DSA framework, Section 4 calculates the fiscal gap, while Section 5 estimates fiscal reaction functions for the country and the ASEAN-5. Section 6 provides concluding remarks.

[1] The authors are, respectively, Senior Research Fellow, Research Fellow, Supervising Research Specialist, Senior Research Specialist, and Research Analysts at the Philippine Institute for Development Studies. This study was carried out with support from the *Bangko Sentral ng Pilipinas* (BSP). The views expressed in this publication are the authors' alone and are not necessarily the views of the BSP.

2. Impact of the COVID-19 Crisis on public finances in the Philippines

Fiscal deficits of emerging market and developing economies around the world ballooned as they faced the worst pandemic in over a century (Badia et al. 2021, Kose et al. 2021). In the Philippines, the national government's fiscal deficit as a share of GDP more than doubled from 3.4 percent to 7.6 percent in 2020, which is a bigger shortfall than any experienced since the mid-1980s (Figure 2.1). The primary deficit, which excludes government spending on interest payments on public debt, and the consolidated public sector deficit, which refers to the combined financial position of national government and other government entities,[2] both widened to about 5.5 percent.

Fiscal responses of government included two fiscal packages meant to cushion the effects of the public health crisis and economic downturn (Bayanihan I designed for relief and Bayanihan II for relief and recovery); the Corporate Recovery and Tax Incentives for Enterprises or CREATE law, a supply-side stimulus geared towards fiscal restructuring; and infrastructure and other stimulus and social spending in the succeeding year's national budget (Debuque-Gonzales 2021). The IMF (2021) estimates that the Philippine government provided direct budgetary support of roughly 4.4 percent of GDP during the pandemic, with an additional 0.6 percent of GDP in below-the-line measures, mainly for credit guarantees.

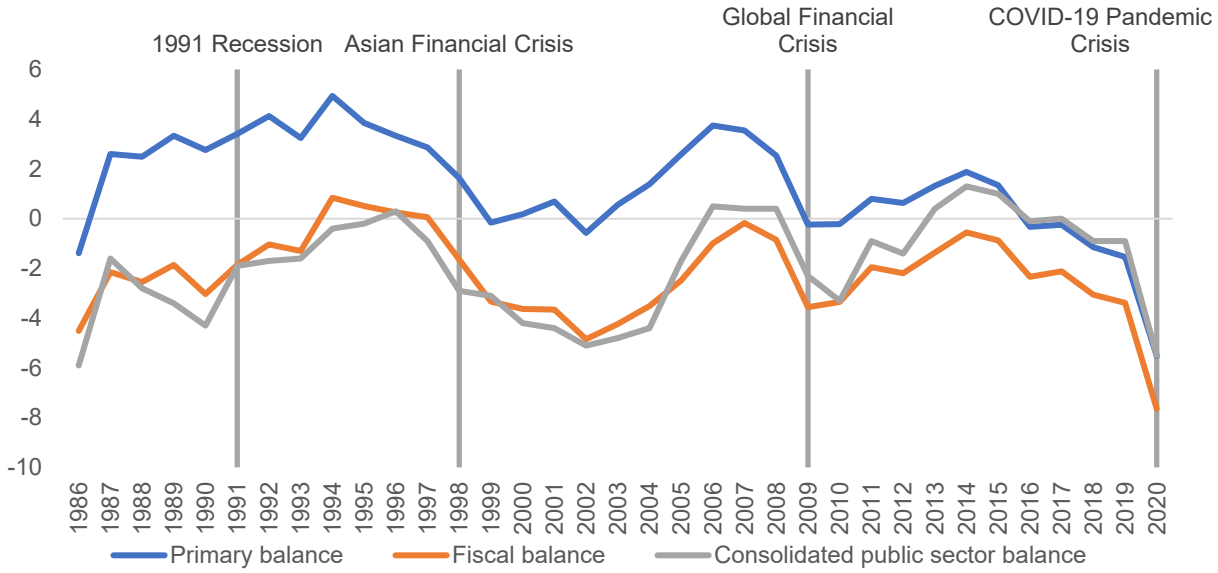
National government spending thus accelerated by 11.3 percent (in nominal terms) in 2020 (Figure 2.2). Yet public spending growth was not unusually high during the pandemic compared to past fiscal packages to be the major cause of the fiscal shortfall—at 10.5 percent in real terms in 2020 based on the national income accounts, compared to 15.5 percent in 2012, when government tried to reverse the effects of past underspending, or to 11 percent in 2009, when it attempted to avert a recession during the global financial crisis (GFC). It was also smaller compared to public expenditure growth in more recent years when government tried to crank up infrastructure spending.[3] Rather, it had been government revenues that saw an exceptional decline, collapsing by 9 percent (in nominal terms) as the economy shrunk.

[2] These include government financial institutions, major non-financial corporations, local government units, social security institutions, the Oil Price Stabilization Fund (OPSF), the Bangko Sentral ng Pilipinas, and the net loss of the old Central Bank.

[3] As part of public health restrictions and following the Bayanihan I law, some public works had to be limited, discontinued, or postponed in 2020 leading the government to downsize its public infrastructure program by 1.6 percent of GDP during the year.

Figure 2.1. Primary balance, fiscal balance, and consolidated public sector balance, 1986-2020

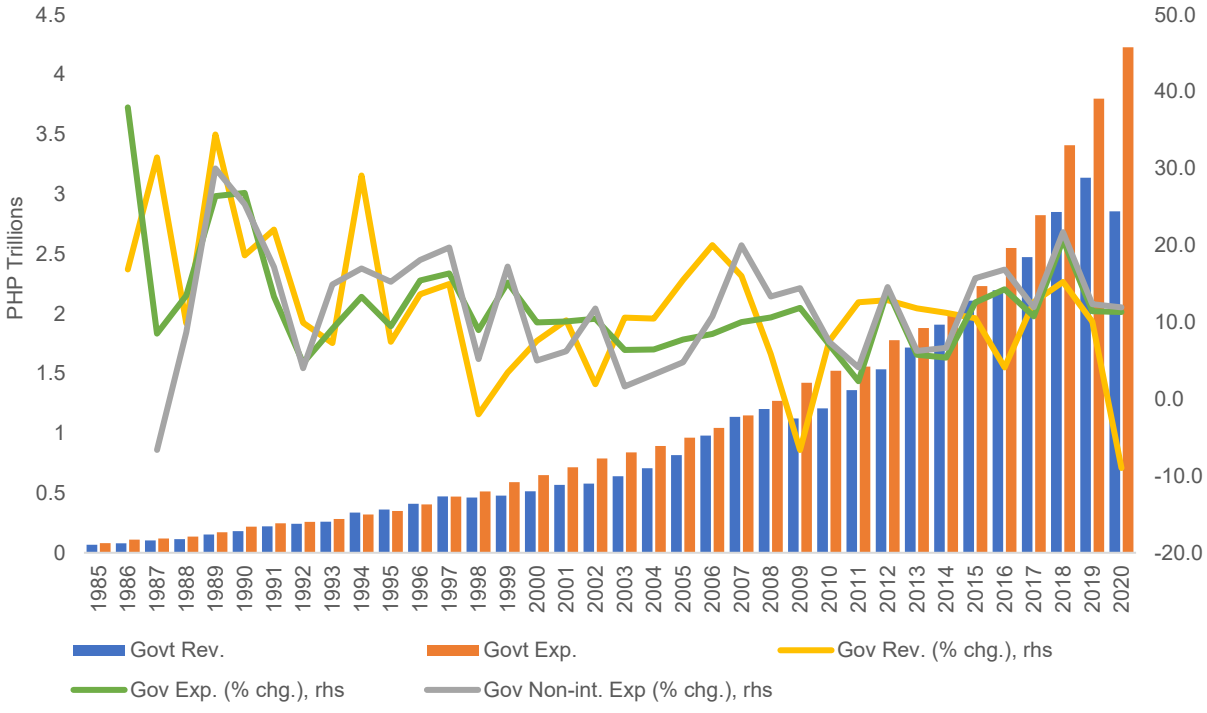
Percent of GDP



Sources: Bureau of the Treasury, Department of Finance.

Figure 2.2. Government revenues and expenditures, 1985-2020

Level and percent change

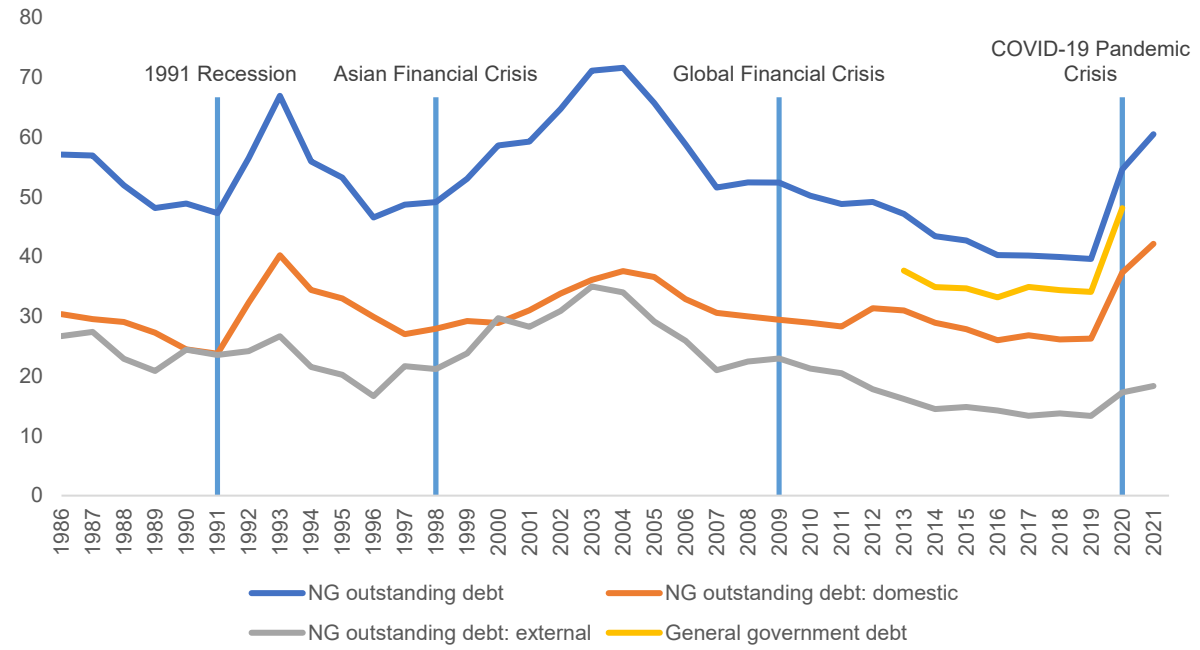


The large fiscal deficit inevitably led to a significant increase in government borrowing. National government debt as a percentage of GDP grew to 54.6 percent in 2020, from 39.6 percent in 2019, and expanded further to 60.5 percent in 2021, breaching the government's indicative cap of 60 percent (Figure 2.3). The debt-to-GDP ratio exceeded this level in 1993 and then in 2002, following years of mounting fiscal deficits beginning the late 1990s, after the Asian financial crisis (AFC). It peaked at 71.6 percent in 2004. After a major tax reform and some fiscal restraint, the government managed to bring public debt down to more comfortable levels by 2007. The debt ratio then steadily dipped, to around 40 percent of GDP by 2016, and stabilized around that level in the years that followed, just prior to the COVID-19 pandemic.

An escalation of debt is normally considered worrisome, as it entails higher debt service payments and constrains government's fiscal space, limiting growth. As Panel A of Figure 2.4 illustrates, the country had already experienced bouts of very high debt service, with interest payments comprising over a third of revenues, over a quarter of expenditures, and nearly 5 percent of GDP during the periods 1986-1990 and 2001-2005. While not shown in the graph because of lack of historical data, the debt burden had also been particularly heavy following the economic crisis of 1983 to 1985, squeezing resources for development and other public programs, with a subsequent decline in interest payments benefiting social services and other development expenditures (Sicat 2003).

In 2006, total debt service payments reached a staggering 85.7 percent of NG revenues, 53.4 percent of expenditures plus principal, and 12.8 percent of GDP (Figure 2.4, Panel B). After having already fallen to an average of 4.4 percent of GDP and 1.9 percent of GDP by 2016-2019, debt service and interest payments rose to 5.4 percent and 2.1 percent of GDP respectively in 2020 and are expected to further increase as debts fall due.

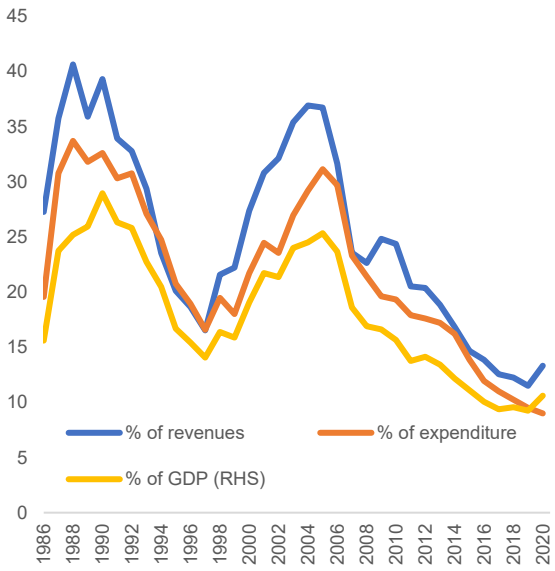
Figure 2.3. National government and government debt as percent of GDP, 1986-2021



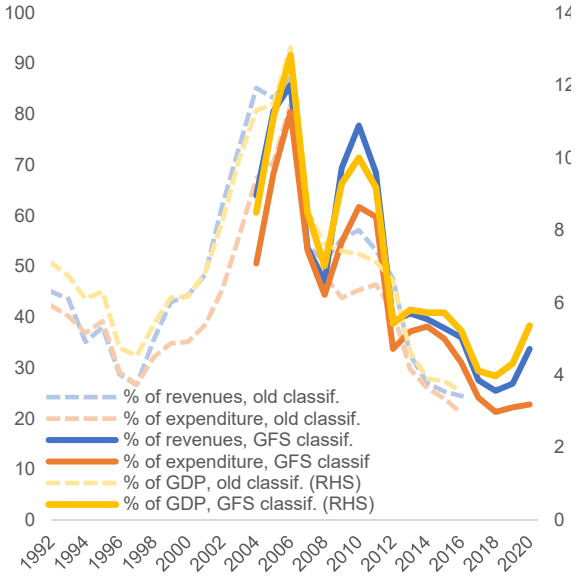
Source: Bureau of Treasury and Department of Finance.

Figure 2.4. Debt interest payments, 1986-2020

A. Debt interest payments
Percent of revenues, expenditure, and GDP



B. Debt service
Percent of revenues, expenditure, and GDP



Source: Bureau of Treasury

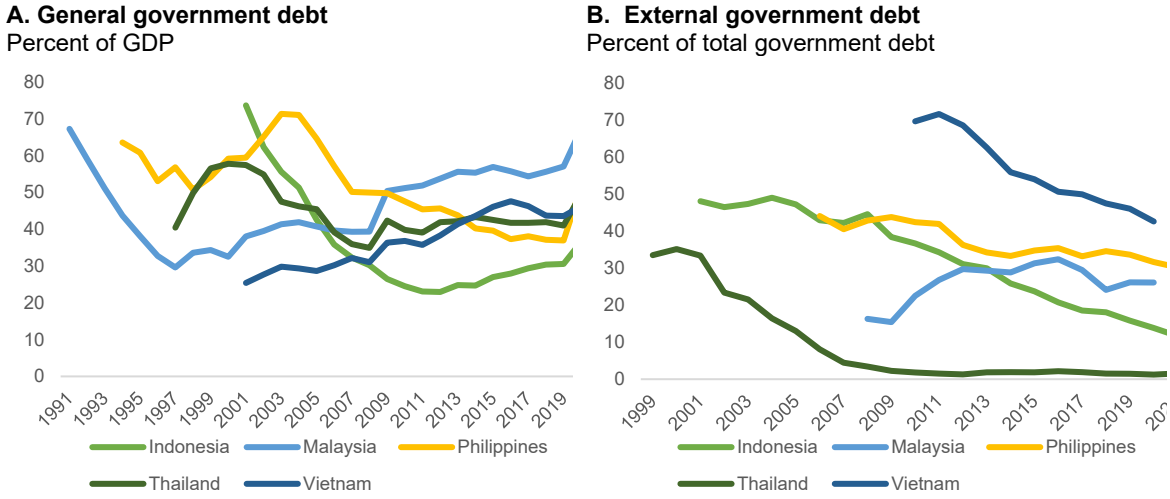
2.1. Debt and fiscal outcomes in ASEAN-5

The Philippines had among the highest debt ratios in ASEAN-5[4] from the mid-1990s to the late 2000s, but among the lowest by 2019, owing to a sustained decline beginning the mid-2000s. However, debt positions throughout the region worsened due to the COVID-19 crisis, with the Philippines registering the steepest increase in its debt-to-GDP ratio (Figure 2.5, Panel A). This traced to widening fiscal imbalances, as public spending accelerated to soften the effects of the COVID-19 pandemic while government revenues slipped due to the pandemic-driven collapse in economic activity (Figure 2.6, Panels E and F).

The country's foreign indebtedness (the share of external debt in total government debt) meanwhile has declined but remains among the highest in the region, at 30.2 percent, second only to Vietnam, at 42.6 percent (Figure 2.5, Panel B). A higher share of foreign-currency debt makes a country more vulnerable to exchange rate fluctuations and offshore risk.

[4] Composed of Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Figure 2.5. Total government and external debt in ASEAN-5 countries

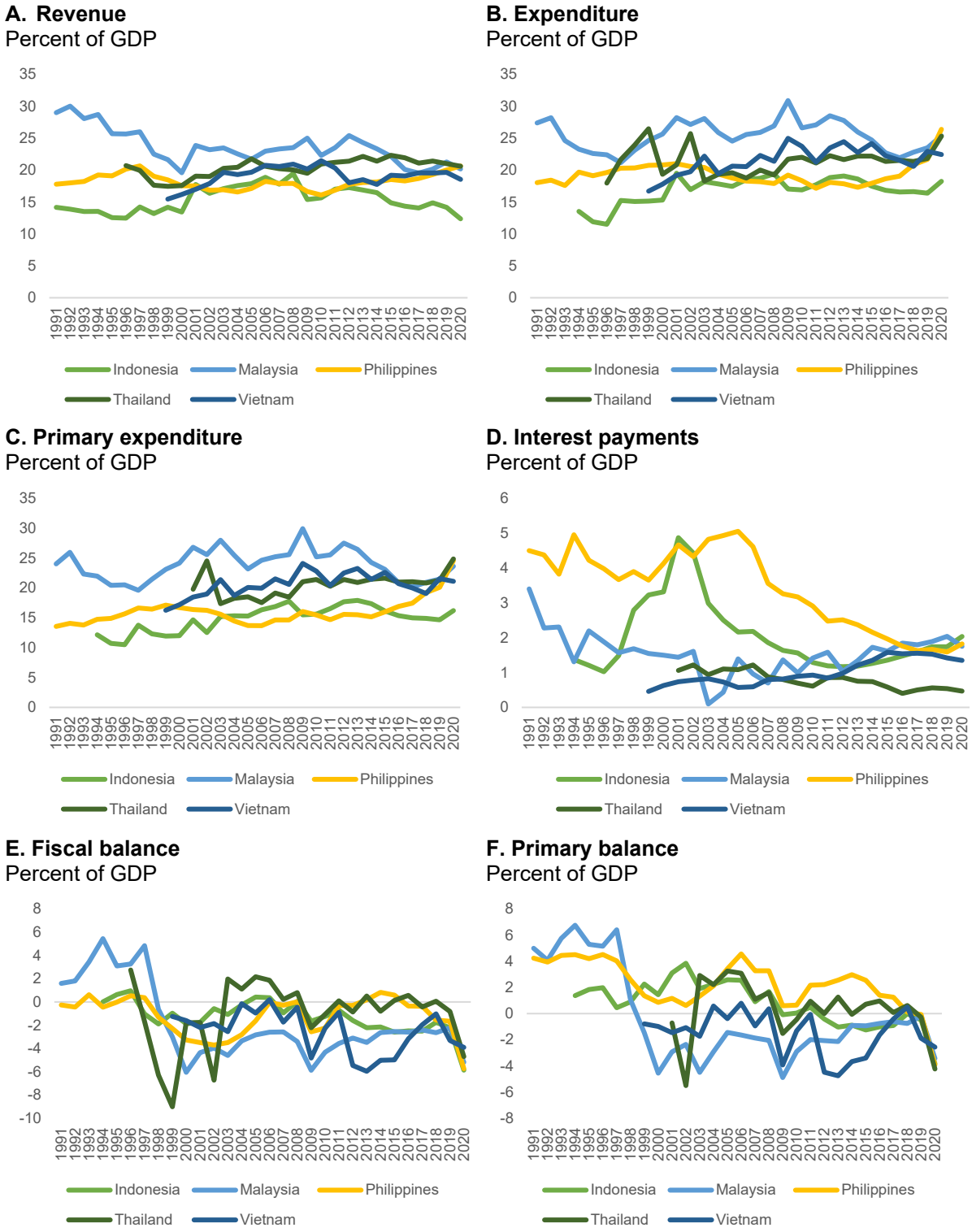


Source: IMF WEO via CEIC (2021) and CEIC Data (2021).

A comparison with regional peers may be instructive in tracking pivotal changes in the country's fiscal performance. Stated briefly, the Philippines' revenue effort lagged those of its ASEAN-5 counterparts in the 2000s through the early-2010s (Figure 2.6 Panel A). Its expenditure effort was similarly among the lowest in the region during the same period (Figure 2.6, Panel B). The country notably had the weakest primary (non-interest) spending-to-GDP ratio for most of the 2000s and early 2010s (Figure 2.6, Panel C), as interest payments cornered a significant portion of total spending. As a percentage of GDP, the Philippines' interest payments were larger than that of any other ASEAN-5 country for nearly every year from the 1990s to the early 2010s (Figure 2.6, Panel D).

From the mid-2010s, however, the Philippines' revenue and expenditure effort both improved and converged with those of its better-performing neighbors. Primary spending as a percentage of GDP also rose and caught up to the level of most of the country's peers, while interest payments as a percentage of GDP declined steadily from the mid-2000s and approached the level of most ASEAN-5 countries by the mid-2010s.

Figure 2.6. Fiscal account of ASEAN-5 countries



Source: IMF WEO via CEIC (2021). Note: Primary spending was computed as revenues minus primary balance. Interest payments were computed primary balance minus fiscal balance.

2.2. Decomposing public debt: a historical view

The COVID-19 pandemic has evidently set back the Philippines' fiscal and debt record. The question that naturally surfaces is whether this is temporary or leading to another debt episode, such as the ones that had dotted the country's history. As remarked on briefly above, these include the debt escalations during the 1980s, the early 1990s, and the early to mid-2000s.

We attempt to answer this question more thoroughly in the succeeding sections of this paper. In this subsection, we provide a quick historical decomposition of the country's debt to provide us a clearer picture of how it has evolved—and how economic and fiscal policy and circumstances have changed (or not)—and to help us predict likely fiscal scenarios, based on how different (or similar) the current debt picture is compared to previous experiences.

The computations are similar to those used in standard debt sustainability analysis (DSA), which we tackle in the next section, with debt dynamics derived from a basic identity equation that characterizes the evolution of the stock of public debt (Appendix A).[5] The slight difference is that we allow for some cross-currency effects in our analysis to more closely match the data.[6] However, we lump together all the other factors that contribute to debt independently of the primary balance and those driving automatic debt dynamics (i.e., the real interest rate , real GDP growth, and the exchange rate), mainly for convenience in building a longer (historical) series.[7] These "other factors" may include recognition of contingent liabilities (implicit and explicit), bank recapitalization, debt relief, other debt-creating (or reducing) items, and other unaccounted factors, including possible asset changes.

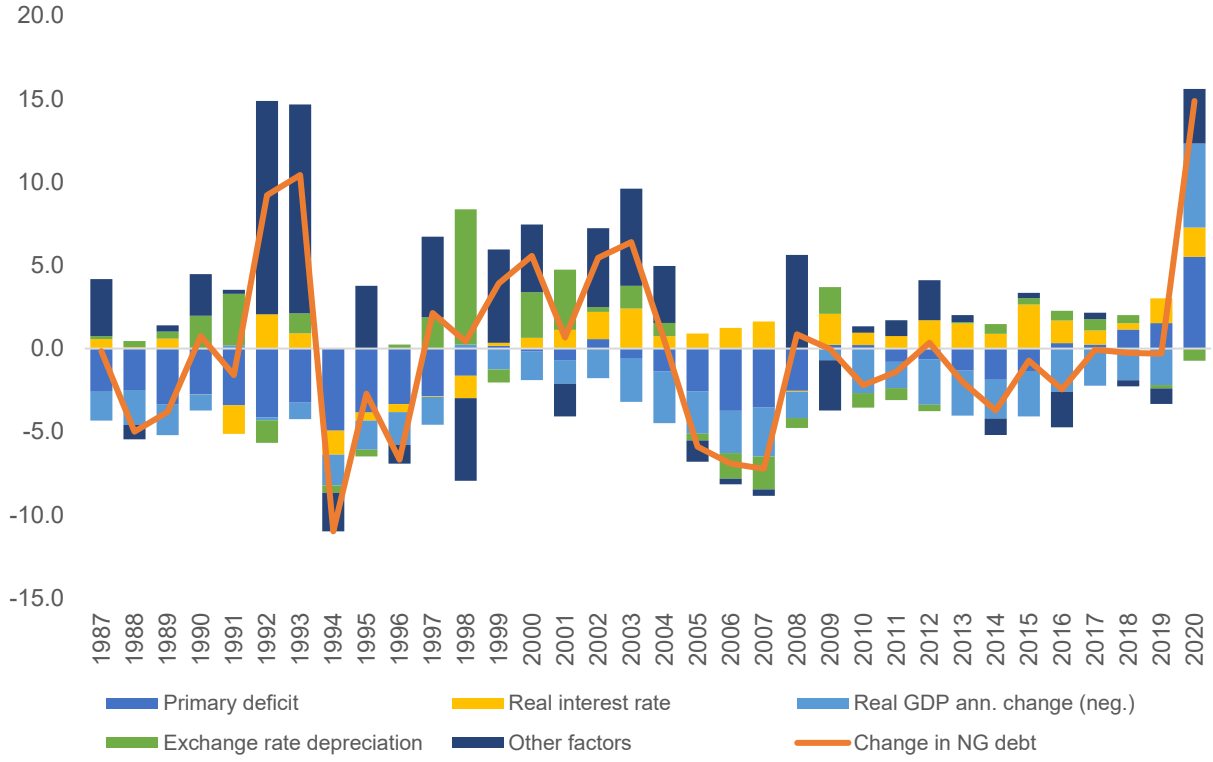
Figure 2.7 displays the resulting historical decomposition of national government debt in the Philippines. Based on calculations of debt dynamics, primary surpluses (or lower deficits) as well as lower real interest rates and higher real economic growth (negative $r - g$) serve to reduce public debt, while exchange rate depreciation adds to the government's debt burden because of its impact on foreign-currency-denominated borrowings.

From the graph, one can see that the sharp increase in the debt-to-GDP ratio in 2020 was driven mainly by the drop in growth (light blue bar) and the large primary deficit (medium blue bar). Figures 2.8 to 2.10 summarize the movements of the relevant macro variables. Other factors added to public debt (dark blue bar), and as more detailed parsing in the next section will further show, a large part of the debt accumulation during the height of the COVID-19 pandemic had actually been due to government's build-up of cash buffers from its domestic and external borrowings, which accounted for nearly half of the rise in the debt-to-GDP ratio.

[5] The slight difference is that we allow for some cross-currency changes in our analysis, i.e., between the dollar and the yen.
[6] Mainly, from the changes between dollar and the yen.
[7] Note that higher inflation can also reduce the debt ratio in this analysis.

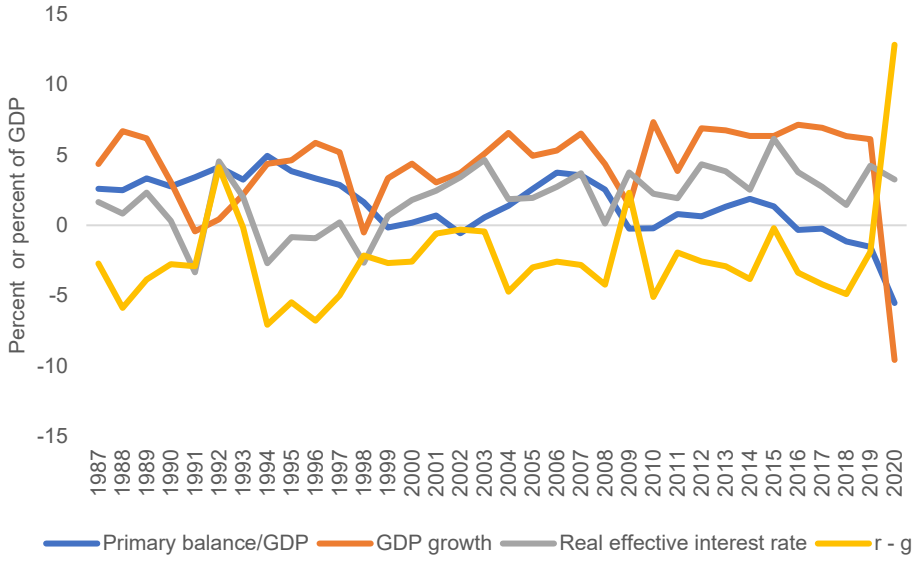
Figure 2.7. Historical debt decomposition, 1987-2020

Contribution to changes in the debt-to-GDP ratio



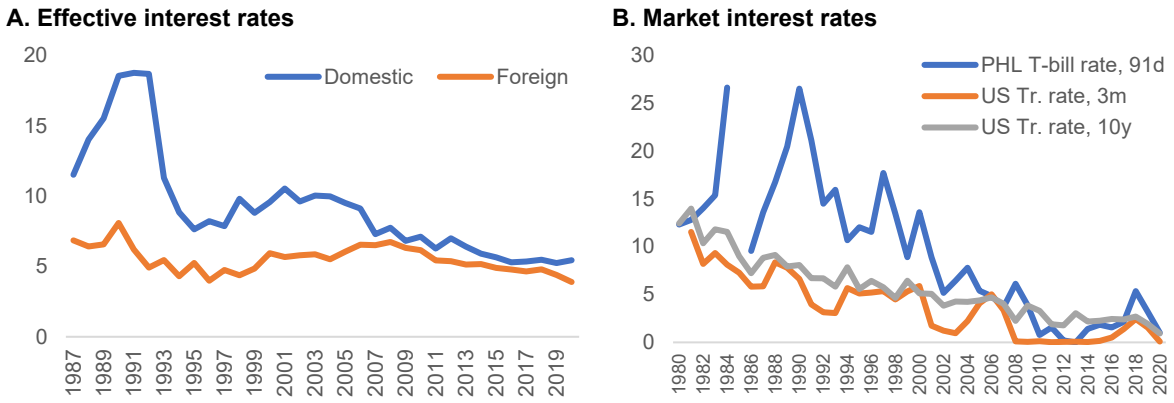
Source: Bureau of the Treasury, Bangko Sentral ng Pilipinas, Philippine Statistics Authority, authors' calculations.

Figure 2.8. Primary balance and *r-g* in the Philippines, 1987-2020



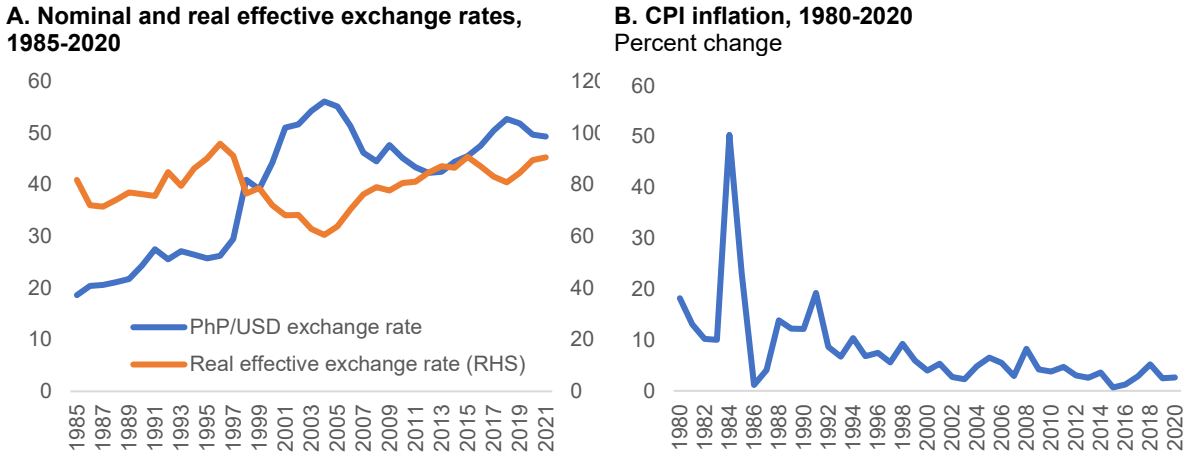
Sources: Philippine Statistics Authority, Bureau of the Treasury, and authors' calculation.

Figure 2.9. Domestic and foreign interest rates



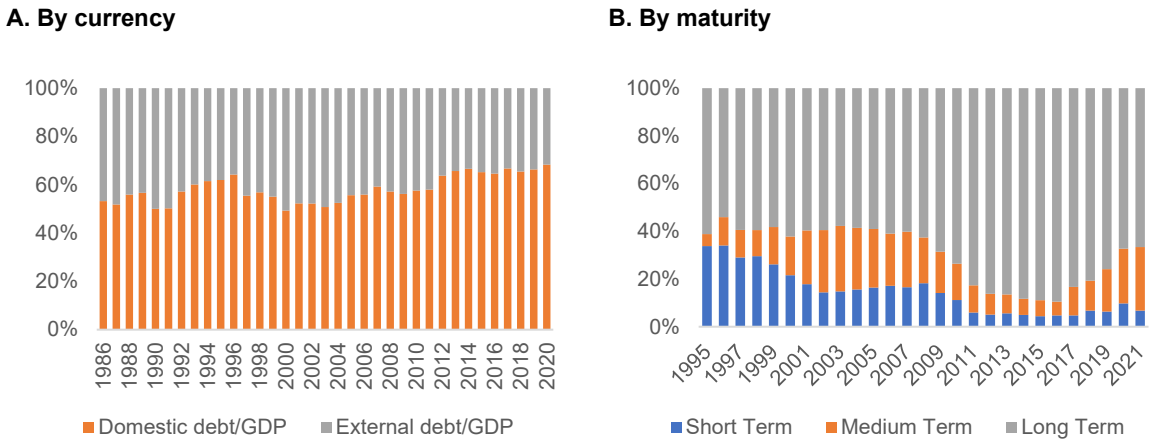
Sources: Bangko Sentral ng Pilipinas, Bureau of the Treasury, US Federal Reserve Board, and authors' calculations.

Figure 2.10. Price and the exchange rate movements



Source: Bangko Sentral ng Pilipinas.

Figure 2.11. National government debt structure



Source: Bangko Sentral ng Pilipinas.

Domestic currency appreciation (green bar), on the other hand, helped slow debt accumulation, an unusual development in the context of an economic crisis in the Philippines.[8] This occurred mainly because of a boost in gross international reserves that sprung from a surprise improvement in the country's current account (imports falling faster than exports during the recession) and foreign exchange inflows from official loan agreements entered to support the country's COVID response.

The current debt episode differs from earlier ones in several important ways. Unlike the debt crises of the 1980s, for instance, it has not been due to excessive external debt coupled by a severe interest rate shock, where higher interest payments lead to a ballooning of liabilities (see Figures 2.8 and 2.9). In contrast, the share of foreign-currency debt, while comparatively high versus ASEAN-5 neighbors, has been steadily declining (Figure 2.5, Panel B), while both domestic and foreign interest rates have been low (Figure 2.9) and countercyclical in recessions, though there are substantial risks of global rates abruptly rising as inflation climbs. Risks associated with the structure of public debt have lessened over the years, as government has leaned towards domestic-currency debt (Figure 2.11, Panel A),[9] away from short-term maturities (Figure 2.11, Panel B), and closer to more balanced issuances.

Unlike the late 1980s and early 1990s, public debt accumulated during the pandemic has not been precipitated by "hidden deficits" stemming from losses of off-budget public enterprises and institutions that failed to become self-sustaining and were eventually absorbed by the national government, as observed by Sicat (2003). The impact of the absorption of hidden liabilities is evident in Figure 2.7 (see dark blue bars) from the late 1980s to the early 1990s, and even until the earlier half of the 2000s. These comprised mostly inherited debt (from the Marcos era) such as from the Central Bank (replaced by the Bangko Sentral ng Pilipinas in 1993); restructuring of government financial institutions such as the Development Bank of the Philippines and the Philippine National Bank; and the National Power Corporation or NPC (see Sicat 2003, de Dios et al. 2004).[10]

Helped by privatizations, the financial position of government corporations and financial institutions, in comparison, has greatly improved over the years, helping to further bring down debt risks. Budget support for such entities—through net lending, equity, or subsidy—fell from a high point reached in the 1980s (over 4% of GDP in 1986) to slightly above 1% in 2019 (Figure 2.12). Although subsidies rose in the past decade, mostly for public institutions in the agriculture and health sectors, they remain well below 2 percent of GDP.[11]

Liabilities of government corporations and financial institutions assumed by the national government likewise dropped from over 20 percent in the late 1980s to nearly zero by the mid-2000s (Figure 2.13). Meanwhile, guaranteed debt of such institutions followed a more circuitous path, falling from a high of nearly 20 percent of GDP until the early 1990s, rising steadily until the mid-2000s to over 15 percent, then dropping to well below 3 percent in recent years (Figure 2.14). By the mid-2010s, the consolidated public sector deficit had become visibly smaller than the fiscal deficit (Figure 2.1), while general government debt had correspondingly been smaller than central government debt (Figure 2.3).

[8] See for instance exchange rate movements during the AFC and the GFC (Figure 2.10). Depreciation greatly added to the debt during those years, in 1998 and 2009, respectively, as shown in Figure 2.7.

[9] It is quite well known that historically, public debt had been mostly held by the country's residents (Guinigundo 2012).

[10] In the early 2000s, the national government also engaged in significant on-lending to Power Sector Assets and Liabilities Management (PSALM)—which assumed all outstanding obligations of NPC after the passage of the Electric Power Industry Reform Act of 2001—totaling PhP39.9 billion. This amount was folded into the public debt statistics, under the category of the Treasury bonds and notes, along with issuances to the Central Bank Board of Liquidators (CB-BOL).

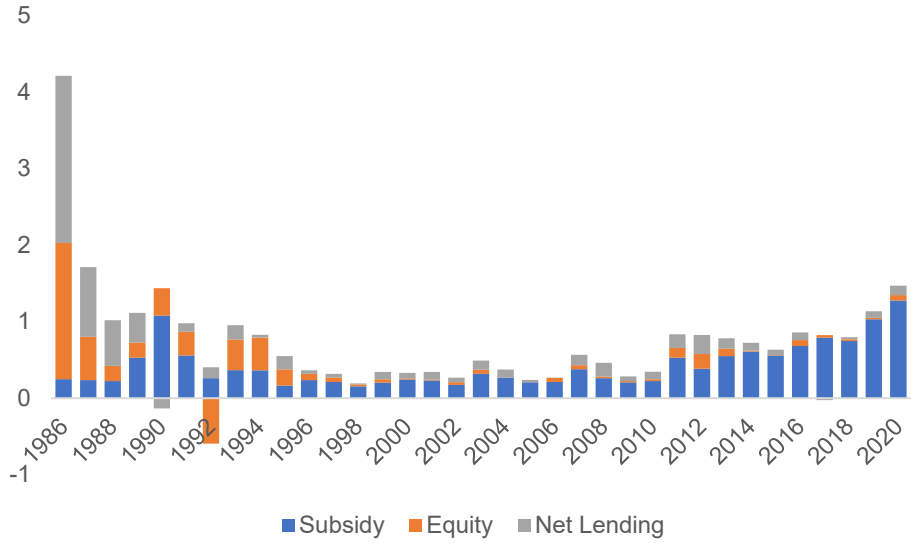
[11] The recent bump in subsidies to government corporations and financial institutions traces to the PhP51 billion funding (0.3% of GDP) provided to the Social Security System of the Philippines for their wage subsidy program for employees of small businesses, which was rolled out by the government in 2020, in response to the COVID-19 pandemic.

Finally, unlike the debt escalation of the mid-2000s, where a declining tax and revenue efforts beginning the late 1990s, after the AFC, had been identified as the main problem (de Dios et al. 2004), the decade prior to the COVID-19 pandemic had seen a steady albeit slow rise in tax effort (Figure 2.15). It was in dealing with the mid-2000s debt problem that the national government was first able to reverse the decline in tax performance and consequently lower the debt trajectory through primary surpluses as well as a more favorable macroeconomic environment (Figure 2.7). This was achieved through the help of a tax reform law—Republic Act 93371 or the Reformed VAT Law—that expanded the coverage of the value-added tax (VAT), as the previous version had numerous exemptions, while also raising the VAT rate (from 10% to 12%).

The RVAT law was followed by other tax-related reforms through the years, all of which helped to incrementally improve the country's tax performance (see Box 2.1). Spending reforms meanwhile have also been implemented and geared towards achieving greater efficiency, by minimizing waste and preempting corruption (see Box 2.2). A few years prior to the COVID-19 pandemic, the government had been able to pass the Tax Reform for Acceleration and Inclusion (or TRAIN) law followed by two additional excise tax adjustments.

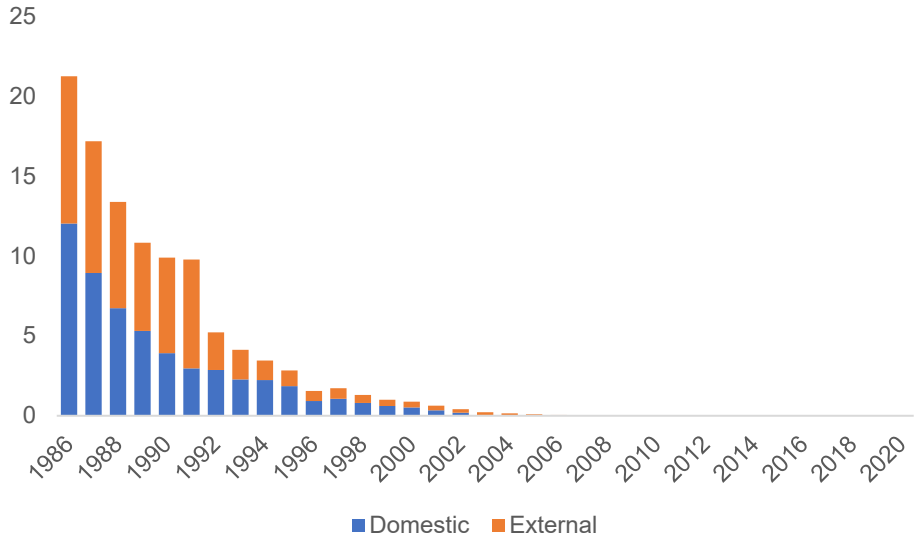
Figure 2.12. Budget support to government corporations and financial institutions

Percent of GDP



Source: Bureau of the Treasury.

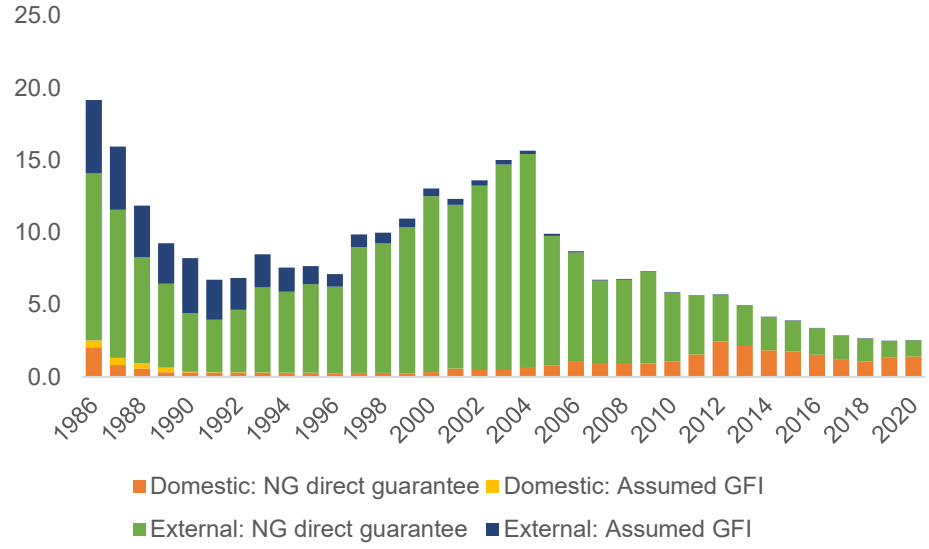
Figure 2.13. Assumed liabilities



Note: This includes assumed loans of DBP, NPC, PNB, PNPP, NDC, TIDCORP, and PAL. Source: Bureau of the Treasury.

Figure 2.14. Guaranteed debt

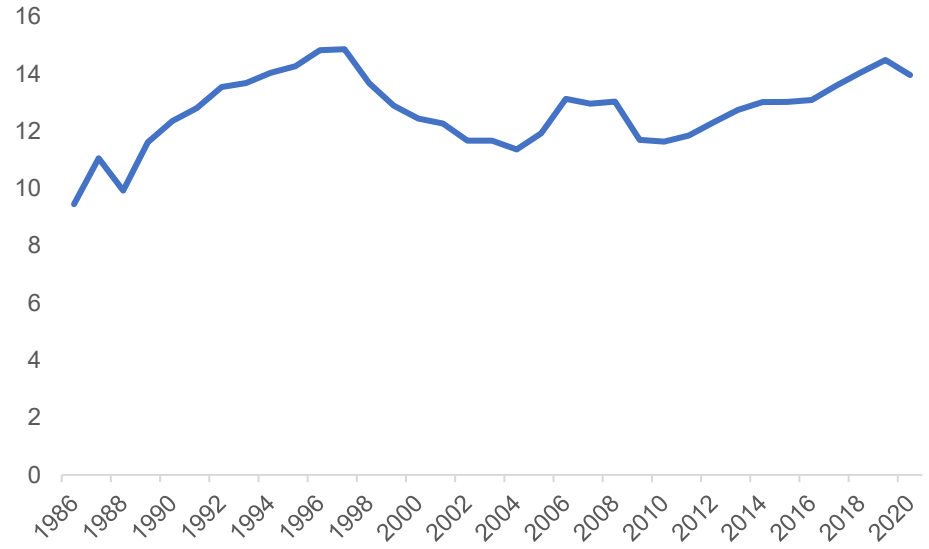
Percent of GDP



Source: Bureau of the Treasury.

Figure 2.15. Philippine tax effort

Tax revenues in percent of GDP



Source: Bureau of the Treasury.

Box 2.1. Tax reforms in the Philippines

Tax effort was at its lowest in 1984 and highest in 1997 based on recent history (see Figure 2.15). The tax system was considered regressive until 1985 due to its overreliance on indirect taxes because of the nature of the Philippine economy during this period, where majority of the import-substituting industry goods relied on imported intermediate goods (Diokno 2010). The government addressed weaknesses through the 1986 tax reform program (TRP), which aimed to "simplify the tax system, make revenues more responsive to economic activity, promote horizontal equity, and promote growth by correcting existing taxes that impaired business incentives" (Diokno 2010, p. 44).

Subsequent tax reforms included the Expanded Value Added Tax (VAT) Law (RA 7716), approved in 1994 and amended in 1996 through RA 8241. Attempts to further improve tax performance also came with the 1997 Comprehensive Tax Reform Program (CTRP), which aimed to broaden the tax base; reduce tax avoidance; boost payments through adjustment of exemption levels, tax rates, and procedures; and rationalize the allocation of tax (Diokno 2005).

The 1997 CTRP did not result in improved tax effort, however, as the ratio of taxes to GDP in 1998 continued to slip until 2004. Tax effort increased after 2005 owing to specific legislations, notably Republic Acts 9334 and 9335, which were enacted in 2004. RA 9334 increased excise taxes on alcohol and tobacco products (also referred to as "sin taxes") while RA 9335, otherwise known as the Lateral Attrition Law, incentivized revenue collection by providing rewards and incentives along with revenue targets. More notable however was Republic Act 9337, or the VAT Reform Act, which expanded the coverage of the VAT and increased the VAT rate (from 10% to 12%), among other salient features. Tax effort rose by about 1.2 percent of GDP during the first year of its implementation in 2006.

The Sin Tax Reform Law (RA 10351), which restructured excise taxes on alcohol and tobacco by simplifying the previous excise tax system and helped finance the country's universal healthcare program, was subsequently passed in 2012. Meanwhile, the Tax Incentives Management and Transparency Act (RA 10708) enacted in 2015 sought to optimize the social benefits of tax incentives through better monitoring of its management and economic impact.

More recently, economic authorities advocated a multi-package CTRP to further simplify the tax system, improve efficiency, and raise the revenues needed to finance the government's infrastructure program. Package 1 was passed in 2018 through the Tax Reform for Acceleration and Inclusion 1 or TRAIN law (RA 10963), complemented by RA 11213 or the Tax Amnesty Act (or Package 1B). Tax effort was thus able to rise by half a percentage point to 14 percent of GDP in 2018, the first year of implementation, and to 14.5 percent of GDP in 2019 as embedded tax increases (i.e., excises on fuel) were activated.

Subsequently, two more sin tax laws were signed into law and implemented in 2020—namely, RA 11346 and RA 11467—which further raised excise taxes on cigarettes and alcohol. However, government revenues because of the COVID-19 pandemic, with tax revenues in particular shrinking by 11.4 percent in nominal terms. Although GDP also contracted, tax effort still declined to 14 percent of GDP.

More recently, the country passed Package 2 of the CTRP through the CREATE Act, which lowered corporate income tax rates from 30 percent to 25 percent (and further to 20% for smaller corporations with lower net taxable income). The lower tax rates are retroactive to the second half of 2020.

Box 2.2. Expenditure reforms

In the late 1990s, there were major public financial management reforms in the Philippines to improve the entire budget process and the performance of the public sector. Citing delayed economic growth because of the two-year validity (and therefore, implementation) of the national budget, the government adopted a what-you-see-is-what-you-get-policy (WYSISYG) by making the General Appropriations Act (GAA) an allotment order and the basis for implementation. This continuing policy of the "GAA as an Allotment Order" was included as a General Provision in annual GAAs. In the FY 2022 GAA (Republic Act No. 11639), for example, this policy is contained in Section 3 of the General Provisions, under the heading "The General Appropriations Act as the Allotment Order" (see Volume I-B, page 784).

In 2002, procurement reform was also initiated to standardize processes and facilitate the swift implementation of PPAs. Republic Act 9184, known as the "Government Procurement Reform Act", was thus passed. RA 9184 requires that procurement by government offices in the Philippines be transparent and competitive, and have a system for a streamlined process, accountability, and public monitoring. The same law requires each procuring entity to establish a Bids and Awards Committee (BAC) that will be responsible for posting the invitation to bid, evaluating bidders and their bids, and recommending the award of contracts to the head of the procuring entity or their authorized representative. The implementing rules and regulations of RA 9184 were later revised in 2016, but the general principles of government procurement and the general functions of the BAC remain the same.

In 2011, the Philippines returned to a zero-based budgeting to prioritize projects and ensure that there are legitimate justifications for its funding. In 2019, a major budget reform to speed up budget implementation to realize fiscal multiplier benefits to the economy sooner was the shift from an obligation-based budget to annual cash-based appropriations where appropriations are only valid for one year, further expediting budget execution. With this shift, only programs and projects that are "shovel-ready" or ready for implementation are part of the budget (DBM 2018a). This raises the level of discipline and accountability of the government as well as its transparency and credibility to suppliers and contractors (DBM 2018a).

However, in response to sliding demand during the pandemic, the government continued to push for lower corporate income tax rates, this time as a supply-side fiscal stimulus, which led to the passage of the CREATE Act in 2021, retroactive to the second half of 2020. The government expects revenue losses amounting to 0.7 percent of GDP in 2021 and 0.5 percent of GDP in 2022 from this law but expects higher future investments and consequently higher economic growth because of it.

All told, the reasons for the high debt precipitated by the COVID-19 pandemic are arguably not as deep-rooted (or self-inflicted) as in past debt episodes, but the result of a large exogenous shock to growth and revenues and of the government's accumulation of cash reserves as a precautionary move in the event of a long-haul public health crisis.[12] Risks are nonetheless high, given uncertainty in the movement of macroeconomic variables (especially, world inflation and the impact on global interest rates) taking into consideration developments in advanced countries and other emerging market and developing economies.

Meanwhile, other factors more domestic in nature remain that must be carefully balanced in the context of managing debt—these include the continued need for fiscal measures to prevent economic scarring due to continued unemployment, business closures, and disruptions in education/training and planned investment in a prolonged pandemic crisis, as well as the effect of a change in the sharing of internal revenue as a result of the Mandanas ruling.[13] Both threaten to widen the fiscal deficit in the near to medium term, especially as the country's tax effort remains below the oft-recommended level of 15 percent of GDP (the benchmark noted in Gaspar, Jaramillo, and Wingender, 2016). These and other important fiscal risks are more closely examined in the next section.

2.3. Post-COVID -19 fiscal outlook

Lastly, we look at the fiscal outlook of both the public sector and the private sector against the backdrop of the COVID-19 pandemic, given the importance of expectations in determining debt limits and the corresponding fiscal space. These are derived from the government's medium-term fiscal program and the consensus view of forecasters from various financial institutions and research and forecasting firms (see Tables 2.1 and 2.2, respectively).

We will be using these same projections on key fiscal and other macroeconomic variables (i.e., real interest rates and growth, and the exchange rate) in computing the public debt trajectory of the Philippines. The assumption is that the country's economic authorities have useful information on their own planned fiscal policy adjustments in the medium term, with such information provided for greater transparency; and that the consensus forecast would already contain adequate information, with competition among private forecasters presumably rewarding precision, while also incorporating a more representative private-sector view.[14]

In their DSA framework, the IMF (2013) highlights the importance of having realistic forecasts for primary balance adjustment and realistic assumptions for the other key macroeconomic variables when projecting the debt-to-GDP ratio. In assessing public debt sustainability in developing Asia, Ferrarini and Ramayandi (2015, p.18) likewise note that the standard DSA approach of the IMF and the World

[12] The country's finance secretary has repeatedly emphasized the importance of maintaining fiscal responsibility, to be "ready for the long haul and keep our powder dry for a protracted battle" (Dominguez, 2021; Department of Finance Media Release, 21 July 2021). The accumulation of liquid assets is also meant to take advantage of the still low interest rates under expansionary monetary policy and still healthy appetite for the government's issuances.
[13] According to the Supreme Court ruling on the Mandanas-Garcia petition, the share of LGUs from national taxes should include national internal revenue taxes collected by the Bureau of Internal Revenue (BIR) as well as customs duties collected by the Bureau of Customs (BoC), thus increasing the allotment to local governments by about 1.0 percent of GDP (roughly 27.6% more than before the SC decision).
[14] Moreover, Loungani (2001) finds a high degree of similarity between the private sector (consensus) forecasts of output growth and the corresponding predictions of international organizations such as the IMF, the OECD, and the World Bank: Their forecast errors have a correlation of 0.7 or better.

Bank have proven to be a "fairly accurate tool" for estimating debt-to-GDP ratios for as long as they are premised on reasonable underlying macroeconomic and fiscal assumptions.

Based on the government's latest medium-term fiscal program (Table 2.1), fiscal policy had been kept expansionary until 2021, but fiscal deficits are projected to slowly taper, from 8.2 percent of GDP in 2021 to 5.1 percent in 2024. The private sector has similar views on post-COVID-19 fiscal policy but expects smaller fiscal shortfalls in the near term and eventual normalization of the fiscal deficit (to 3.1%) by 2026.

With tax cuts (particularly CREATE) taken into consideration, the government expects (nominal) revenue growth to remain below the pre-pandemic (5-year) average of 10.5 percent until 2023 but is forecast to eventually pick up pace. By 2024, government revenues are forecast to grow by 11.7 percent, while revenue effort is expected to climb back to 15.9 percent. Meanwhile, planned spending, will also be slower than the pre-pandemic average (of about 14%). Government disbursements are set to rise at an uneven speed—by 6.9 percent in 2022, by 2.1 percent in 2023, and by 5.7 percent in 2024.[15]

The interest-growth differential will likely remain negative with a more normal pace of economic activity in the near to medium term. Both public and private sector projections place GDP growth at about 6 to 7 percent during the period. Private forecasters meanwhile anticipate upticks in the policy rate and market interest rates and expect inflation to be in the middle of the central bank's target band. They also expect the peso-dollar exchange rate to be relatively stable and well within government's macroeconomic parameters, appreciating slightly each year from 2022 to 2026.

The private consensus view on the national government debt-to-GDP ratio is that it will peak at 62.4 percent in 2022, then slowly dip below the government's indicative 60-percent benchmark in four years, to 59.2 percent by 2026. Using the various expectations of the relevant macroeconomic variables mentioned above, we next examine (in Section 3) if debt estimates will be in the same ballpark using a more detailed framework tailored to emerging market and developing economies, such as the DSA framework outlined in IMF (2013) through templates made publicly available in their website. [16]

Looking at post-crisis trajectories (see Box 2.3), it seems reasonable to expect a fiscal adjustment to eventually occur after a period of high debt. But such dynamic fiscal policy responses—to prevailing debt levels as well as to movements in other crucial determinants of the primary balance—may not be captured in a standard (deterministic) DSA, which incorporates often bare fiscal assumptions. This lessens the realism of the computed debt trajectory, especially for the medium term. While this paper does not undertake a probabilistic DSA, one that incorporates dynamic feedback mechanisms (such as the impact of past debt and the macroeconomic environment on fiscal policy and vice versa), an undertaking we reserve for future research, we take the first step in this direction by attempting to estimate a fiscal reaction function (FRF) applicable to the Philippines. This empirical exercise is documented in Section 5, where FRFs are estimated for the Philippines and the greater ASEAN-5 region.

[15] The uneven growth of planned spending is likely influenced by the Mandanas ruling, where the new tax base for local governments is computed based on actual tax collections in the third fiscal year preceding the current fiscal year (e.g., the 2022 allocation based on collections made in 2019, and the 2023 allocation based on collections made in 2020).

[16] However, instead of projecting the debt-to-GDP ratio using general government figures (for deficits and past debt), we focus on national government debt which is released by the Bureau of the Treasury (BTr) at shorter and more regular intervals.

Table 2.1. Government's medium-term fiscal program, FYs 2021-2024

Particulars	2020	2021p		2022f	2023f	2024f
	Actual	Program	Outlook		Projections	
Revenues (PhP bn)	2,856.0	2,881.5	3,026.8	3,304.1	3,624.4	4,048.8
% of GDP	15.9%	14.8%	15.5%	15.3%	15.5%	15.9%
Growth rate	-9.0%	0.9%	6.0%	9.2%	9.7%	11.7%
Disbursements (PhP bn)	4,227.4	4,737.1	4,633.1	4,954.6	5,059.3	5,347.3
% of GDP	23.6%	24.3%	23.8%	23.0%	21.6%	21.0%
Growth rate	11.3%	12.1%	9.6%	6.9%	2.1%	5.7%
Surplus/(Deficit) (PhP bn)	(1,371.4)	(1,855.6)	(1,606.2)	(1,650.5)	(1,434.9)	(1,298.5)
% of GDP	-7.6%	-9.5%	-8.2%	-7.7%	-6.1%	-5.1%
Infra. program (PhP bn)	869.9	1,019.1	1,094.6	1,271.1	1,294.9	1,377.1
% of GDP	4.8%	5.2%	5.6%	5.9%	5.5%	5.4%

Note: Based on 180th DBCC Meeting (December 14, 2021). Figures for the infrastructure program are indicative and subject to updating. They refer to disbursements from NG infrastructure, infrastructure/equity to government-owned and controlled corporations, and transfers to local government units intended for infrastructure activities. It includes payables from current year's and prior years' obligations. Source: Development Budget Coordination Committee, Department of Budget and Management.

Table 2.2. Macroeconomic parameters of government

	2022f	2023f	2024f
Real GDP growth (%)	7.0-9.0	6.0-7.0	6.0-7.0
Inflation (%)	2.0-4.0	2.0-4.0	2.0-4.0
Dubai crude oil (USD/barrel)	60-80	60-80	60-80
Exchange rate (PhP/USD)	48-53	48-53	48-53
Growth of goods exports (%)	6.0	6.0	6.0
Growth of goods imports (%)	10.0	8.0	8.0

Source: Development Budget Coordination Committee, Department of Budget and Management, NEDA, BSP.

Table 2.3. Private sector outlook (February 2022 Consensus forecasts)

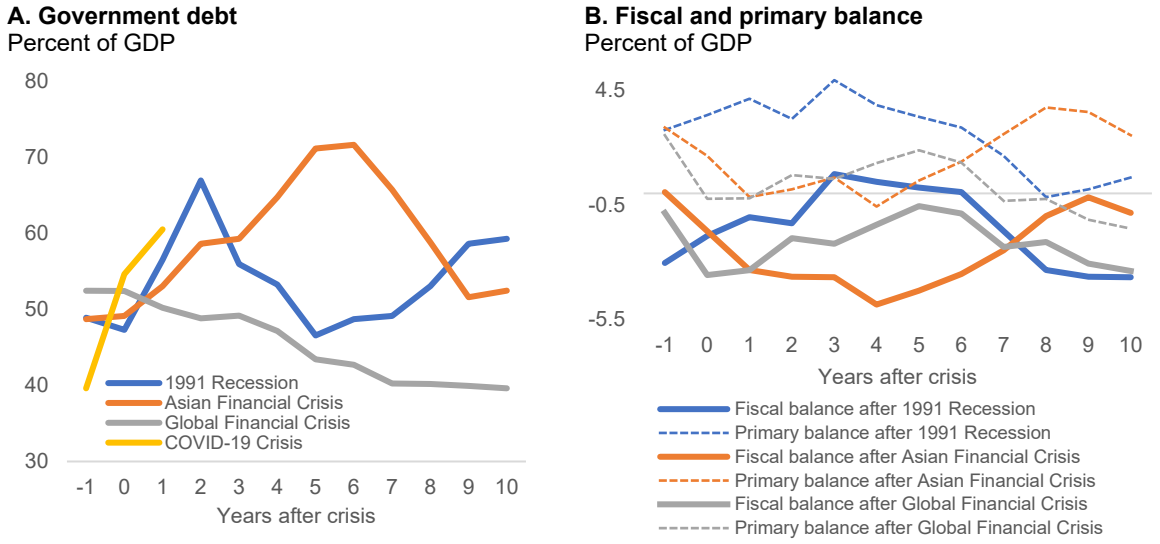
	2019	2020	2021	2022f	2023f	2024f	2025f	2026f
NG debt (% of GDP)	39.6	54.6	60.5	62.4	62.3	61.3	60.2	59.2
GDP growth	6.1	-9.6	5.6	6.9	6.4	6.5	6.4	6.3
Government consumption	9.1	10.5	7.0	5.6	3.8	4.8	5.2	5.6
Fiscal balance (% of GDP)	-3.4	-7.6	-8.4	-6.9	-5.6	-4.6	-3.9	-3.1
Inflation	2.5	2.6	4.4	3.3	3.2	3.1	3.1	3.1
Policy rate	4.00	2.00	2.00	2.35	2.86	3.20	3.52	3.84
91-day treasury rate	3.19	1.02	1.13	2.50	3.08	-	-	-
10-year treasury rate	4.44	2.97	4.90	5.33	5.49	5.55	5.69	-
Exchange rate (PhP/USD)	51.8	49.6	49.3	51.0	51.1	50.7	50.5	50.3
Export growth				12.1	5.3	8.8		
Import growth				27.9	5.4	9.2		
Current account balance (% of GDP)	-0.8	3.1	-0.9	-1.5	-1.5	-1.4	-1.5	-1.5

Forecasted values are in shaded cells. Source: *FocusEconomics*. 2022, Consensus forecast: Philippines (February); Bureau of the Treasury; Philippine Statistics Authority.

Box 2.3. Post-crisis trajectories

Figure 2.16 illustrates the historical trajectories of government debt, the fiscal balance, and the primary balance after every economic crisis in the Philippines beginning the 1990s. Crisis points naturally raise debt levels whether by decline in revenues or increase in (countercyclical) spending. However, the government seems able to eventually lower fiscal imbalances or build primary surpluses, through fiscal prudence and/or tax-related reforms (such as an increase in taxes or tax administration improvements).

Figure 2.16. Debt, fiscal balance, and primary balance post-crisis trajectories



The debt-to-GDP ratio increased for two years after the 1991 Recession, peaking at 66.9 percent in 1993, despite being accompanied by a narrowing fiscal deficit (see also Figure 2.1 and 2.7-2.8) driven by the strengthening of the revenue effort attributed to tax reforms initiated during the period (Figure 2). As mentioned earlier (in Subsection 2.2), this largely traced to government's absorption of hidden liabilities in off-book public institutions, including inherited debt. The government then turned modest fiscal surpluses for four years from 1994, due partly to hefty privatization receipts (mainly from the sale of Fort Bonifacio) in 1994 (1.5% of GDP) and 1995 (1% of GDP). This fiscal improvement helped bring down the debt ratio to 46.6 by the end of 1996.

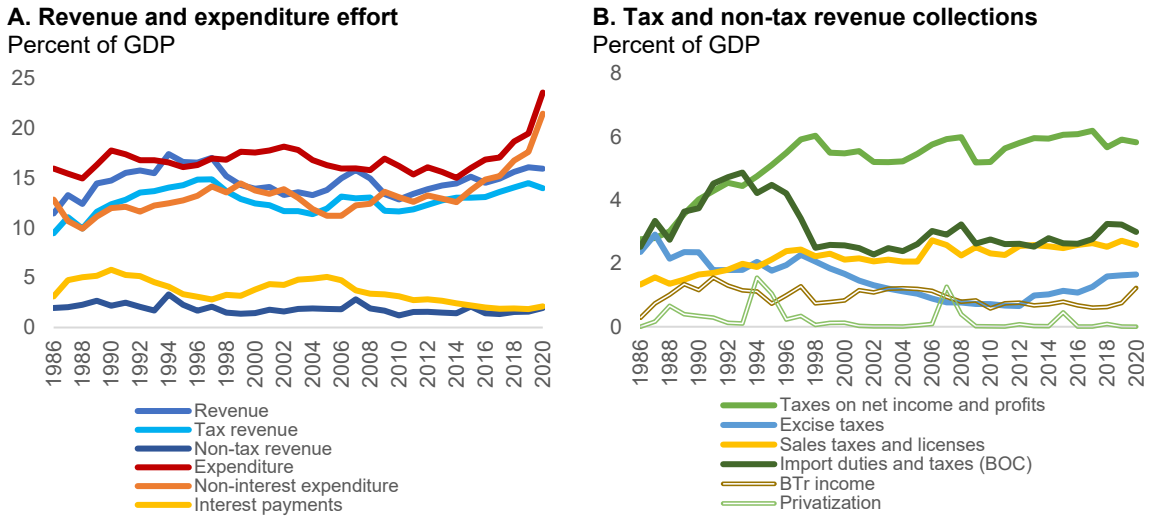
After the Asian Financial Crisis, the debt ratio surged from 49.1 percent in 1998 to a peak of around 71 percent in 2003-2004 as the country's fiscal deficit steadily widened, reaching 5.1 percent of GDP in 2002. A combination of weakening tax effort (which slid from 13.7% in 1998 to 11.6% during 2002-2004[17]) and rising interest payments (which, as a percentage of GDP, climbed from 3.3% in 1998 to about 4.7% in 2002-2004) drove the fiscal deterioration.

The government's fiscal position then began strengthening in 2003 and reached near-balance by 2007, driven initially by the compression of primary spending, and later, by a recovery of the tax effort from the passage of tax reforms, especially VAT reforms that expanded tax coverage and raised tax rates. Large privatization proceeds in 2007 (1.26% of GDP) emanating principally from the privatization of the Philippine National Oil Company also bolstered the revenue effort. These developments, along with growth improvements, led to a substantial reduction of the debt ratio, falling to 51.6 percent by the end of 2007.

[17] As a percentage of GDP, tax collections from various sources slipped starting in the mid- to late-1990s, including taxes from net income and profits (from 6% in 1998 to 5.2% in 2002-2004), excise taxes (from 2.1% in 1997 to 1.2% in 2002-2004), and import duties and taxes collected by the Bureau of Customs (from 4.2% in 1996 to 2.4% in 2002-2004).

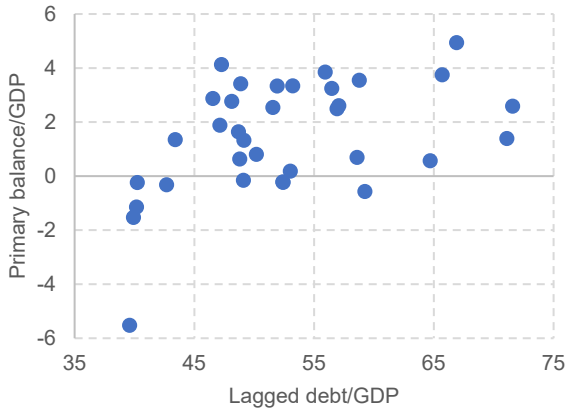
In 2009, the debt ratio remained steady at 52.4 percent despite the slowdown in GDP growth and rise in fiscal deficit (to 3.6% of GDP) resulting from the Global Financial Crisis. Contributing to the deficit was the government's fiscal stimulus package, amounting to PhP330 billion (3.9% of 2009 GDP) in spending, tax cuts, and off-budget interventions. A rising tax effort, stable primary spending, and declining interest payments in subsequent years combined to help shrink the fiscal deficit to 0.6 percent of GDP by 2014. Consequently, along with fairly strong growth (greater than 6% annually), the debt-to-GDP ratio declined to around 43 percent in 2014-2015.

Figure 2.17. Revenue performance in the Philippines, 1986-2020



The (apparent) behavioral pattern of fiscal consolidation to rein in high public debt levels is further illustrated in Figure 2.18, which plots the country's primary balance as a percentage of GDP against the lagged debt-to-GDP ratio. There appears to be a positive relationship between the two variables, indicating that an increase in debt in the current year is associated with a positive primary balance adjustment in the following year.

Figure 2.18. Primary balance vs. lagged debt, 1987-2020



3. Debt sustainability analysis of the Philippines

A crucial part of the response to the COVID-19 crisis involves examining the capacity of the government to sustain debt. This section uses standard debt sustainability analysis (DSA) as described in IMF (2013) to assess public debt dynamics in the Philippines in the next five years. If the Philippine government is projected to be able to satisfy its current and future payment obligations without the need for exceptional financial assistance or default, public debt is considered sustainable.

The approach is a practical one, with the notion of sustainability hinged on whether the primary balance can stabilize public debt in baseline and realistic scenarios based on amounts that are both economically and politically feasible; it is also consistent with an "an acceptably low rollover risk" and with preserving potential growth "at a satisfactory level" (IMF 2013, p.14). Estimates depend crucially, however, on having reliable data and on coming up with accurate projections and assumptions for fundamental variables such as GDP growth, inflation, domestic and foreign interest rates, exchange rates, primary fiscal balances (based on interest and non-interest government income and spending), and other flows that may influence debt levels.

3.1. DSA method and data

The research adopts the standard DSA method described in IMF (2013) to compute public debt and public debt dynamics in the Philippines. The publicly available template is used to generate an IMF-style fan chart and alternative scenarios to stress-test the baseline scenario. The DSA makes use of the ratio of total gross public debt to nominal GDP as the measure of the baseline scenario and debt burden trajectory. The evolution of the stock of public debt is expressed as[18]:

$$D_{t+1} = \frac{e_{t+1}}{e_t} * \left(1 + i^f_{t+1}\right) * D^f_t + \left(1 + i^d_{t+1}\right) * D^d_t - (T_{t+1} + G_{t+1} - S_{t+1}) + O_{t+1} + RES_{t+1}$$

where,

D^f_t = stock of foreign currency-denominated debt at the end of period t

D^d_t = stock of local currency-denominated debt at the end of period t

e_{t+1} = nominal exchange rate (LC/USD) at the end of period t

i^f_{t+1} = effective nominal interest rate on foreign currency-denominated debt in period $t+1$

i^d_{t+1} = effective nominal interest rate on local currency-denominated debt in period $t+1$

T_{t+1} = total NG revenue (in local currency) in period $t+1$

G_{t+1} = total NG grants to the national government in period $t+1$

S_{t+1} = total NG non-interest expenditures (in local currency) in period $t+1$

O_{t+1} = other identified debt-creating flows in period $t+1$ such as privatization receipts, contingent liabilities, debt relief, bank recapitalization, and others.

RES_{t+1} = residual

The subscript t is time, while f and d pertain to foreign and domestic-currency denominated debt.

18 Taken from IMF Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries (2013).

This is same equation can be redefined to be able to project the public debt-to-GDP ratio.

$$d_{t+1} - d_t = \left(\frac{1}{1+g_{t+1}}\right) * \left(d_t * \left[r^d_{t+1} \frac{d^d_t}{d_t} + r^f_{t+1} * \frac{d^f_t}{d_t} \right] - d_t * g_{t+1} + d^t_f * \xi_{t+1} * \left(1 + r^f_{t+1}\right) \right) - pb_{t+1} + o_{t+1} + res_{t+1}$$

Contribution of the effective real interest rate

Contribution of real GDP growth

Contribution of the real exchange rate

Contribution of primary balance and other factors

where,

$$\left(1 + i^d_{t+1}\right) = \left(1 + r^d_{t+1}\right) * \left(1 + \pi^d_{t+1}\right)$$

$$\left(1 + i^d_{t+1}\right) = \left(1 + r^f_{t+1}\right) * \left(1 + \pi^f_{t+1}\right)$$

$$1 + \xi_{t+1} = \frac{e_{t+1}}{e_t}\left(\frac{1 + \pi^f_{t+1}}{1 + \pi^d_{t+1}}\right)$$

Other debt burden indicators are generated such as the ratios of debt service and gross financing needs to GDP and to revenue. In the analysis of the stress tests, the study delves more into the gross nominal public debt (in percent of GDP and of revenue), and public gross financing needs (in percent of GDP). This also aids the analysis on the presence of macro and fiscal risks to debt sustainability.

The study used secondary data primarily from national government sources such as the DBM, Bureau of Treasury, DOF, and BSP to complete the data inputs for public sector data, historical debt data, banking sector data, macro and debt service forecast, issuance of new debt to fill fiscal needs, and fan chart data. Public sector data pertains to macroeconomic variables such as GDP, inflation (GDP deflator), exchange rates, revenues, and expenditures of national government. Historical debt refers to public debt from 2009 to 2020, and data disaggregated by tenor, currency, and residency criterion. Banking sector data refers to private sector credit, bank gross foreign assets, and loan-to-deposit ratio. Debt service forecast includes variables on interest expenditures, principal payments, in addition to public sector data to compute for gross financing needs to fill fiscal needs. Issuance of new debt to fill fiscal needs is a forecast of how the government would finance its needs with domestic and external debt, including factors such as the currency denomination, tenor, and the rate at which new debts may be issued. Lastly, the fan chart is generated based on the calculations of historical averages, variances, and covariances of real GDP growth rate, effective real interest rate, primary balance, and change in real exchange rate.

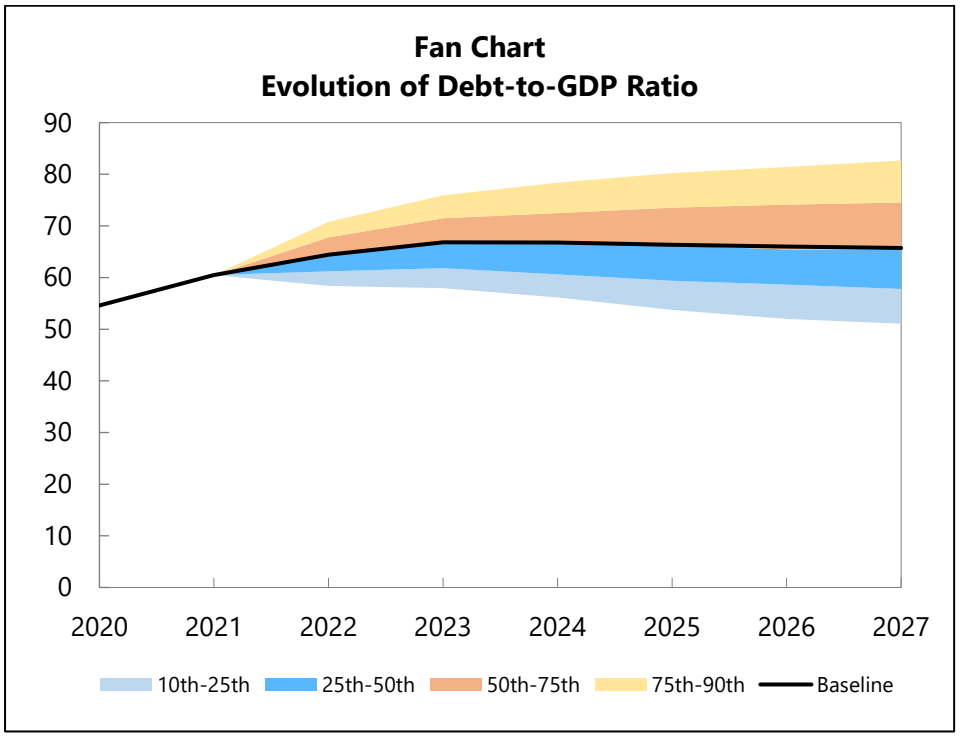
Philippine data from World Bank, the Philippine Article IV report and World Economic Outlook of International Monetary Fund (IMF), CEIC, and Focus Economics were also gathered for certain variables needed in the Debt Sustainable Analysis (DSA) template. It is important to note that although the Philippines is not a higher scrutiny country, the IMF DSA template requires certain data variables for higher scrutiny countries. Furthermore, the analysis would be only as good as the quality and completeness of the data used. However, due to data availability limitations, especially for the projection years of select indicators, certain data assumptions were made to complete the data inputs (see Appendix B for the full list of data assumptions).

3.2. *Results*

The historical data shows that debt has been managed at relatively low levels at about 40 percent of GDP. The impact of the pandemic resulted in an unanticipated rise to 54.6 percent in 2020 and 60.5 percent in 2021 due to the increased financing needs of the government in response to the pandemic. The generated fan chart shows the projected baseline scenario of the debt-to-GDP ratio for the years 2022 to 2027 (Figure 3.1). Debt burden would be at its highest in 2023 at 66.8 percent and may stay around that level until 2024 before gradually declining over the succeeding years as the GDP growth rate is expected to drive the debt ratio down.

However, the national government fiscal program estimates show the presence of cash reserves. This budgetary change in cash is recorded as other debt flows which increases debt but, since it is positive, it represents funds/liquidity that could be drawn against if needed by the national government. Historically, the public debt ratio had breached 70 percent in 1993 (when there was a power crisis) and then again in 2002-2003 (a period of heavy external borrowing according to Diokno (2010) as mentioned above).

Figure 3.1. DSA fan chart, 2020-2027



It is important to note the assumptions made on revenues and expenditures, debt servicing forecast, and GDP projections of the national government especially in the latter years. It is assumed that the country will make efforts toward fiscal consolidation, maintaining the 1.7 percent of GDP primary deficit from 2024 to 2027. The interest revenues are kept at 0.034 percent of revenues and grants, and the interest expenditures are assumed to decrease. With the expectation that the country would move to a trajectory towards economic recovery and the adverse effects of COVID-19 on the decline, Figure 3.1 presents a trend wherein the debt burden would slowly improve due to the gradual increase in GDP and the national government not needing substantial new debt.

If the generated debt-to-GDP ratios hold true to actual figures, the baseline scenario shows that the level of debt is still manageable and sustainable. However, if the impact of COVID-19 persists, or new

variants/ mutations force the country into stricter lockdowns, economic activities would again halt and national government would again need to increase spending which affects the debt-to-GDP ratio. It is expected that the debt would not return to its pre-pandemic levels within the projection years in this DSA, but a continued decline is a positive outlook (Table 3.1).

Table 3.1. Baseline fan chart of debt-to-GDP ratio, 2020-2027

	2020	2021	2022	2023	2024	2025	2026	2027
NG debt/GDP	54.6	60.5	64.4	66.8	66.8	66.4	66.0	65.7

The DSA fan chart also generated other probable debt-to-GDP values with random shocks of real GDP growth rate, effective real interest rate, primary balance, and change in real exchange rate. The generated symmetric fan chart is represented per percentile in the graph, showing upside and downside risks. This reflects how uncertainty in the identified macroeconomic variables may influence the level of debt. Annual adverse shocks would put the debt-to-GDP ratio in the higher percentiles, while the path along the lower percentiles exhibit positive shocks leading to lower debt burden (Table 3.2).

Table 3.2. Debt-to-GDP ratio projections per percentile, 2017-2027

Percentile	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
0.00	0.40	0.40	0.40	0.55	0.60	0.48	0.46	0.42	0.40	0.33	0.26
0.05	0.40	0.40	0.40	0.55	0.60	0.56	0.56	0.53	0.51	0.49	0.47
0.10	0.40	0.40	0.40	0.55	0.60	0.58	0.58	0.56	0.54	0.52	0.51
0.25	0.40	0.40	0.40	0.55	0.60	0.61	0.62	0.61	0.59	0.59	0.58
0.50	0.40	0.40	0.40	0.55	0.60	0.64	0.67	0.67	0.66	0.65	0.65
0.75	0.40	0.40	0.40	0.55	0.60	0.68	0.71	0.72	0.74	0.74	0.75
0.90	0.40	0.40	0.40	0.55	0.60	0.71	0.76	0.78	0.80	0.81	0.83
0.95	0.40	0.40	0.40	0.55	0.60	0.73	0.79	0.83	0.84	0.87	0.87
1.00	0.40	0.40	0.40	0.55	0.60	0.86	1.00	1.08	1.05	1.06	1.08

Outstanding debt of the national government reached PhP1.728 trillion by December 2021 (BTr 2022). The computed baseline gross debt in the template for 2022 is PhP13.746 trillion. The national government has gross borrowings of about PhP2.775 trillion from January to November 2021 (BTr 2021). According to the Budget of Expenditures Sources of Financing (BESF), this is expected to amount to PhP3.072 trillion.

DBCC projects the debt-to-GDP ratio to peak in 2022 and will decline in the succeeding years with the assumptions that GDP growth and fiscal deficit would return to pre-2020 long-run averages starting 2025 (DBCC 2021). On the other hand, the IMF Philippines Article IV report states that the baseline is projected to "peak at about 62 percent in 2024 and then decline over the medium term with a reduction in budget deficits and growth recovery" (IMF 2021). Though this study projects the highest public debt ratio at 66.8 percent, peaking in 2023, in between DBCC (2022) and IMF (2021) projections, there is a declining debt burden trajectory.

3.2.1. Excluding the budgetary change in cash or excess liquidity[19]

Building on earlier baseline assumptions, with only the difference of no change in cash or 'other debt flows' the public debt ratio still peaks in 2023 but lower by 2.6 percentage points (ppts) at 64.2 percent (Table 3.3). Figure 3.2 shows the debt burden which follows the same expectation of lower ratios in the succeeding years.

Figure 3.2. DSA fan chart with the exclusion of budgetary change in cash, 2020-2027

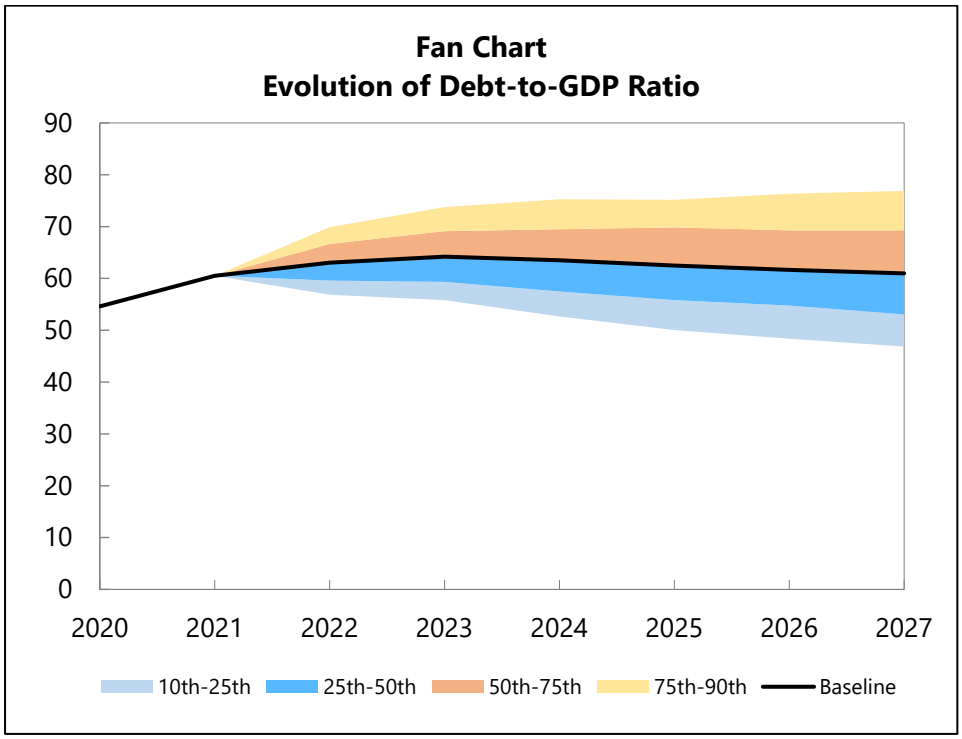


Table 3.3. Fan chart of debt-to-GDP ratio excluding the budgetary change in cash, 2020-2027

	2020	2021	2022	2023	2024	2025	2026	2027
NG debt/GDP	54.6	60.5	63.0	64.2	63.5	62.5	61.7	61.0

3.2.2. Risk scenarios

In the baseline scenario, real GDP growth is expected to increase, which reflects economic recovery though lower than in years leading up to the pandemic. Primary balance is expected to improve from -5.4 in 2022 to -1.7 in 2024 (Table 3.4). The DSA template set the debt burden benchmark for emerging markets at 60 percent. However, to differentiate higher scrutiny countries in assessing the risks, the benchmark for this module was raised to 70 percent[20] (IMF 2013). The data shows that this is not exceeded in the baseline scenario and would only do so under specific shocks. The result of the DSA in this section is similar with the IMF Philippines Article IV in such a way that the government is most vulnerable to a real GDP growth shock as seen in Figure 3.3 below.

[19] Appendix E lists the other resulting DSA tables and generated figures under this scenario.
[20] 85 percent for Advanced Economies.

Figure 3.3. Macro-fiscal stress tests, 2022-2027

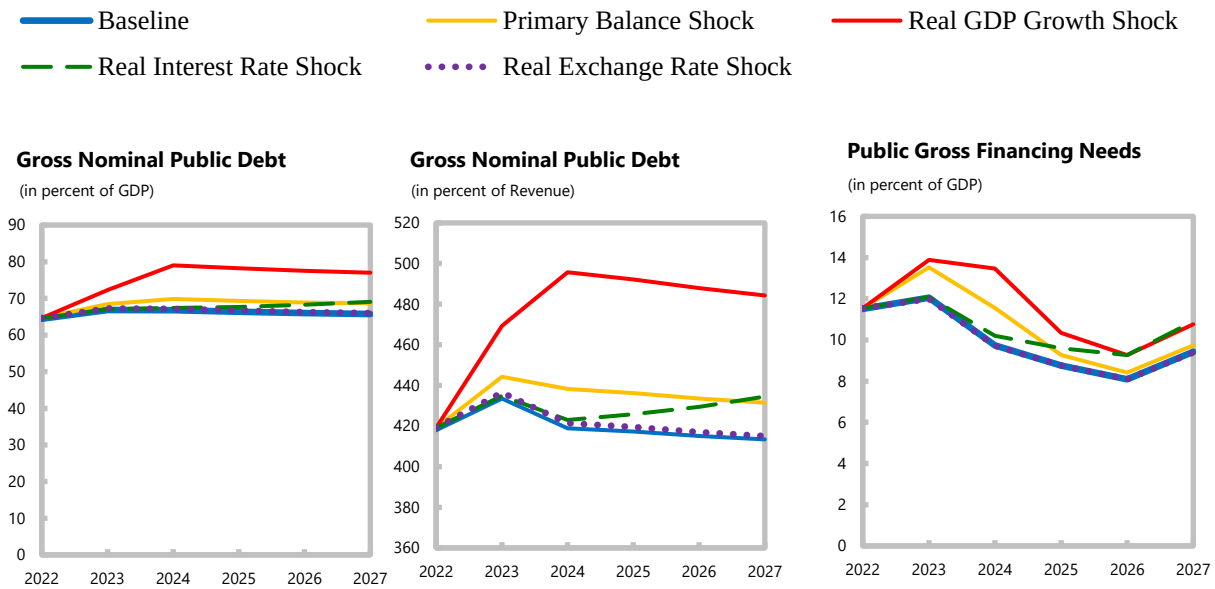


Figure 3.4. Additional stress tests, 2022-2027

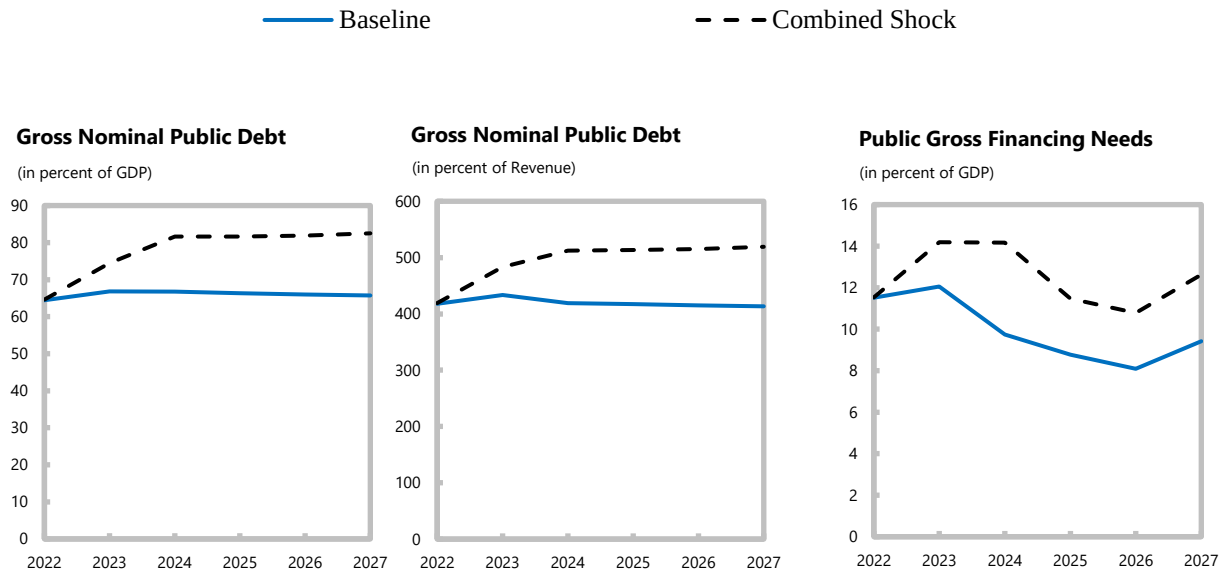


Table 3.4. Underlying assumptions of the DSA stress tests, 2022-2027

	2022	2023	2024	2025	2026	2027
Baseline scenario						
Real GDP growth	6.9	6.4	6.5	6.4	6.3	6.3
Inflation	2.6	2.5	2.5	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	19.2	17.6	17.6	17.6	17.6
Primary Balance	-5.4	-3.8	-1.7	-1.7	-1.7	-1.7
Nominal Exchange Rate – average	51.00	51.10	50.70	50.50	50.30	50.30
Nominal Exchange Rate – end of period	51.40	50.90	50.60	50.40	50.20	50.20
Effective interest rate	4.4	4.8	5.3	4.5	4.6	4.7
Primary balance shock						
Real GDP growth	6.9	6.4	6.5	6.4	6.3	6.3
Inflation	2.6	2.5	2.5	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	20.7	19.0	17.6	17.6	17.6
Primary Balance	-5.4	-5.2	-3.1	-1.7	-1.7	-1.7
Nominal Exchange Rate – average	51.00	51.10	50.70	50.50	50.30	50.30
Nominal Exchange Rate – end of period	51.40	50.90	50.60	50.40	50.20	50.20
Effective interest rate	4.4	4.8	5.3	4.6	4.7	4.8
Real GDP growth shock						
Real GDP growth	6.9	1.3	1.4	6.4	6.3	6.3
Inflation	2.6	1.2	1.2	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	20.5	20.0	17.6	17.6	17.6
Primary Balance	-5.4	-5.1	-4.0	-1.7	-1.7	-1.7
Nominal Exchange Rate – average	51.00	51.10	50.70	50.50	50.30	50.30
Nominal Exchange Rate – end of period	51.40	50.90	50.60	50.40	50.20	50.20
Effective interest rate	4.4	4.8	5.3	4.6	4.7	4.8
Real interest rate shock						
Real GDP growth	6.9	6.4	6.5	6.4	6.3	6.3
Inflation	2.6	2.5	2.5	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	19.2	17.6	17.6	17.6	17.6
Primary Balance	-6.2	-4.5	-2.4	-2.2	-2.2	-2.2
Nominal Exchange Rate – average	51.00	51.10	50.70	50.50	50.30	50.30
Nominal Exchange Rate – end of period	51.40	50.90	50.60	50.40	50.20	50.20
Effective interest rate	4.4	4.8	6.0	5.7	6.2	6.6
Real exchange rate shock						
Real GDP growth	6.9	6.4	6.5	6.4	6.3	6.3
Inflation	2.6	5.1	2.5	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	19.2	17.6	17.6	17.6	17.6
Primary Balance	-5.4	-3.8	-1.7	-1.7	-1.7	-1.7
Nominal Exchange Rate – average	51.00	56.43	55.99	55.77	55.55	55.55
Nominal Exchange Rate – end of period	51.40	56.21	55.88	55.66	55.44	55.44
Effective interest rate	4.4	4.9	5.2	4.5	4.6	4.7
Combine macro-fiscal shock						
Real GDP growth	6.9	1.3	1.4	6.4	6.3	6.3
Inflation	2.6	1.2	1.2	2.5	2.5	2.5
Non-interest revenue-to-GDP ratio	15.4	15.4	15.9	15.9	15.9	15.9
Non-interest expenditure-to-GDP ratio	20.8	20.7	20.0	17.6	17.6	17.6
Primary Balance	-5.4	-5.2	-4.0	-1.7	-1.7	-1.7
Nominal Exchange Rate – average	51.00	56.43	55.99	55.77	55.55	55.55
Nominal Exchange Rate – end of period	51.40	56.21	55.88	55.66	55.44	55.44
Effective interest rate	4.4	4.9	6.0	5.7	6.2	6.6

Real GDP growth shock
This shock is designed as a reduction of one standard deviation for two consecutive years (IMF 2013). The resulting real GDP growth goes down to 1.3 percent and 1.4 percent for 2023 and 2024 from the projected 6.9 percent in 2022. Lower income translates into lower demand for goods and services, and, therefore, a decrease in price level with inflation rates projected to dip from 2.6 percent in 2022 to 1.2 percent in 2023.

A perfect example of real GDP shock is the economic impact of the COVID-19 pandemic. If cases surge, because of mutations or delayed vaccination programs, warranting stricter lockdowns and limited economic activities, this would again adversely affect the economy. This, in turn, might be cause for government to continue implementing social assistance/interventions for those affected while still spending to stimulate the economy. The lower GDP growth paired with higher debt would increase the debt-to-GDP ratio to relatively high levels. Natural disasters and calamities could also impose a real GDP shock.

Primary balance shock
This scenario is designed in such a way that for every 1-percent decrease in primary balance (in percent of GDP), interest rate increases by 25 basis points (bps). Since non-interest revenues are assumed to be the same as the baseline, a primary balance shock reflects the increase in expenditures. The higher deficit would increase financing needs, and therefore necessitating government borrowing possibly leading to higher interest rates.

Primary balance shocks would come from sudden need for increased government spending such as because of the impact of natural disasters etc. Other possible shocks could be realized contingent liabilities from social security institutions, PPPs or underfunded pension plans of uniformed personnel which would result in the national government shouldering the burden. These would increase financing requirements and therefore increased borrowing.

Real exchange rate shock
The DSA template calibrated a real exchange rate shock at 8 percent and nominal exchange rate shock at 10 percent. Exchange rate would increase to above PhP56/USD, and slightly go down in the succeeding years. The scenario also assumes a pass-through to inflation exhibiting how a real exchange rate shock would affect prices, wherein domestic prices of imported goods and services would be higher. Exchange rate shock pass-through elasticity is set at 0.25 for emerging markets and 0.03 for advanced economies. Inflation would increase to 5.1 percent in 2023.

The USD is expected to grow at 6.5 percent in 2021. The strengthening of the USD, and the rising long-term secondary market interest rates have resulted in portfolios being rebalanced towards USD-denominated assets (FSCC 2021). Higher interest rates in the US because of tapering of quantitative easing, might cause capital outflows from the Philippines. This would result in the weakening of the Philippine peso and pose a revaluation risk. However, though the stress tests show the upward trajectory of the debt burden, external debt is still relatively low (the Bureau of Treasury has maintained external debt to be 20 percent of total Philippine debt) and with long term maturities.

A higher exchange rate would affect the cost of foreign debt servicing. From the data, the share of external debt is still relatively low, and most of which are at long-term maturities. Another possible scenario would be if remittances increase resulting from increased global economic activity involving the employment of Philippine overseas foreign workers. This would lead to strengthened Philippine peso therefore leading to an appreciation of the currency. The strengthening of the currency would reduce the revaluation impact.

Real interest rate shock
The shock is calibrated from the difference between the historical max value and the average of the effective real interest rate. Effective real interest rate is a function of the effective interest rate (interest payments over gross debt) and inflation. Since this particular shock assumes that real GDP growth, inflation, primary balance (non-interest revenues and non-interest expenditures), and exchange rate are the same as the baseline, the real interest rate shock, computed as an increase of 400bps compared to the baseline, affects interest payments.

Evidence of higher market yields would put pressure on debt servicing. The debt service forecast in the DSA template was assumed that payments would gradually go up. A scenario of an interest rate shock would increase the debt servicing burden of the government.

Combined macro-fiscal shock
This scenario combines the effects of real GDP growth, primary balance, real exchange rate, and real interest rate shocks. Lower GDP growth associated with lower inflation and higher government spending, leads to costly borrowings due to higher interest rates and exchange rates.

This may be a scenario when the country would again be severely hit or a surge in COVID-19 cases would occur, while the rest of the world, especially advanced economies (AEs) would be on track to recovering economically. In fact, multilateral agencies have already noted the divergence between AEs and Emerging markets and developing economies (EMDEs) (FSCC 2021). The country would have to address the lower economic output, paired with high costs of borrowing both domestic and external. In this scenario, nominal debt-to-GDP would go up to about 80 percent in 2022 and follow a trend of small reductions over the succeeding years.

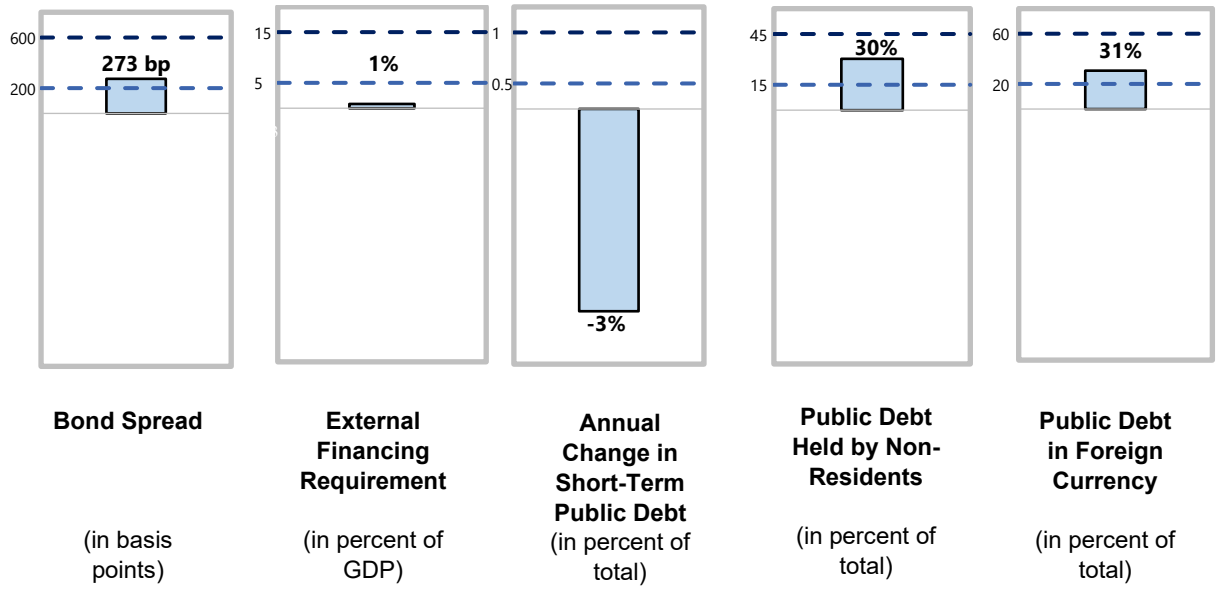
3.2.3. Debt Profile Vulnerabilities

The assessment of debt profile vulnerabilities computed in the DSA template seek to identify possible debt profile risks using signal-approach benchmarks. Indicators included are EMBI[21] global spreads (in bps), external financing requirements (in percent of GDP), public debt in foreign currency (share of total), annual change in the share of short-term public debt, and share of public debt held by non-residents. The assessment makes use of the latest data available (in this case 2021 data) and then compared to the early warning lower and upper benchmarks. The computed values for each indicator are considered low risk if is below the early warning lower benchmarks, moderate risk if in between, and high risk if above the early warning upper benchmark[22].

The debt profile vulnerabilities from the DSA template (Figure 3.5) show a 3-percent decrease in percentage share of short-term public debt which is far from the lower-risk assessment benchmark of 0.5-percent increase. Warranted due to COVID-19, the share of short-term debt significantly increased to 9.8 percent in 2020 which declined to 6.8 percent in 2021 (BTr 2022). The external financing requirement are below the lower risk assessment, while bond spread, the share of public debt held by non-residents, and share of public debt in foreign currency are positioned between lower and upper risk-assessment.

[21] Emerging Markets Bond Index.
[22] From the Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries (2013).

Figure 3.5. Debt profile vulnerabilities



3.2.4. Other possible debt sustainability risks

Supreme Court ruling on the Mandanas-Garcia petition

The risk is posed by the reduced fiscal space because of increased IRA (NTA) to LGUs (about 20 percent of 2021 budget). Most LGUs would be more reliant on IRA from the national government which is currently at 62 percent based on the average dependency in the previous years. The increase in IRA of LGUs paired with lower local revenue especially with COVID-19, poses a concern in the fiscal program of the government, therefore possibly increasing financing needs. (DBCC 2021).

Natural calamities

Every year, the country is expected to face considerable damages from natural calamities. These events would require government spending, which leads to higher financing need. As the Financial Stability Coordination Council (FSCC) notes, "inputting this risk into debt contracts has its benefits, but the cost of insurance may be non-trivial" (FSCC, 2021, p. 6).

In 2020, damages, economic losses, and needs from typhoons Quinta, Rolly, and Ulysses amounted to PhP69.02 billion, PhP35.74 billion, and PhP139.98 billion respectively. On a long-term average basis, the Philippines is expected to incur USD 3.6 billion per year in losses to public and private assets due to typhoons and earthquakes (DBCC, 2021, p. 74).

Military and uniformed personnel pensions

The recognition of contingent liabilities that may arise from GSIS and SSS are expected to increase the debt, but a current concern among policy makers is the impact of the pension of uniform personnel. According to DBCC, the inability to reform the current pension scheme is one of the downside risks to the country's fiscal position. Looking at the 2022 proposed budget, the national government allot a Special Purpose Fund called the Pension and Gratuity Fund specifically for this purpose and on top of the miscellaneous personal benefits fund. This has the highest funding from the Special Purpose Fund, accounting for 6.7 percent or PhP232.9 billion. Finally, the GSIS study on the pensions of MUP

estimates that the national government would have to annually allocate PhP850 billion for the next 20 years (DOF 2021). These also pose a risk to the primary balance. GSIS is firm in its stance that there should be a separation between the pension fund to be established for military and uniformed personnel (MUP) and that of the existing Social Insurance Fund (SIF) for the civilian employees in government (DBCC 2021).

Net losses of PhilHealth

At the expected nominal GDP for 2021 and 2022, the net losses amounting to PhP88 billion and PhP116 billion from PhilHealth alone that need to be shouldered by the national government may significantly increase the debt burden. With this observation, if PHIC were to report net losses for the succeeding years, debt-to-GDP ratios will also be projected to be higher. The level of contribution to the debt burden would only depend on how much would the cost of keeping PhilHealth afloat would be.

Aggregate demand risks

Debt sustainability risks related to aggregate demand are due to risks such as the decreased global credit, geopolitical trade tensions, repatriation with glut in oil, reduced trade with global contraction, lower remittances, and increased number of displaced overseas Filipino workers. Also, lower foreign direct investments are attributable to the increased risk aversion to emerging markets that may also affect domestic economy (DBCC 2021). Persistence of these factors may affect economic output, growth, and eventually the cost of borrowing in the future.

Cybersecurity

This particular risk may be seen in instances of glitches that may prevent transactions, or worse are malicious attacks via ransomware. Especially during this time of COVID-19, there is an even more demand on Information and Communication Technologies (ICT) with alternative work arrangements and Information Technology infrastructure to support the Digital Payments Transformation Roadmap. ICT Infrastructure spending would require the national government to increase expenditures, leading to more borrowing. This also adds to contingent liabilities of the government. However, the FSCC is currently in the final stages of crafting the Systemic Risk Crisis Management (SRCM) framework that may hopefully address these cyber-related challenges (FSCC 2021).

4. Fiscal adjustment in the post-COVID period

The results of the previous section show elevated debt ratios in the medium term, though the bulk of the accumulated debt at the peak of the pandemic crisis consists of accumulated liquid assets, reflecting precautionary behavior of the country's fiscal authorities, given the highly uncertain times. Evaluating the country's debt net of its cash buffers therefore provides an alternative way to examine the country's fiscal conditions.

In this section, we attempt to further measure the country's fiscal imbalances taking longer-term commitments into consideration. This allows us to evaluate the size of the fiscal adjustment needed to bring the debt/GDP ratio closer to targeted or desired levels.

To achieve this, we adopt the fiscal gap measure developed by Auerbach (1994), which provides a convenient gauge of the long-term budgetary state of the government (Auerbach 2020). This measure represents the constant share-of-GDP increase in taxes or reduction in non-interest expenditure—or a combination of both—required annually, over a time horizon, to achieve a target debt/GDP ratio, given an economy's projected growth and fiscal performance.

The fiscal gap, Δ, is given by

$$\Delta = \frac{b_t - \left(\frac{1+g}{1+r}\right)^{T-t} b_T - \sum_{s=t+1}^{T} \left(\frac{1+g}{1+r}\right)^{s-t} pb_s}{\sum_{s=t+1}^{T} \left(\frac{1+g}{1+r}\right)^{s-t}} \qquad (1)$$

where b_t is the initial debt/GDP ratio at time t, b_T is the target terminal debt/GDP ratio at time T, pb_s is the primary balance/GDP ratio in year s, g is the real GDP growth rate, and r is the real interest rate on government debt. Both the GDP growth rate and interest rate are assumed to be constant for simplicity (Auerbach and Gorodnichenko 2017).

For this exercise, we set the initial year to 2021 and the (hypothetical) target debt/GDP ratio to 40 percent, a nice, round number that is equivalent to the average debt ratio in the four years preceding the pandemic (2016-2019). We calculate the fiscal gap over time horizons of 10, 20, and 30 years, corresponding to reaching the target debt ratio in 2031, 2041, and 2051, respectively.

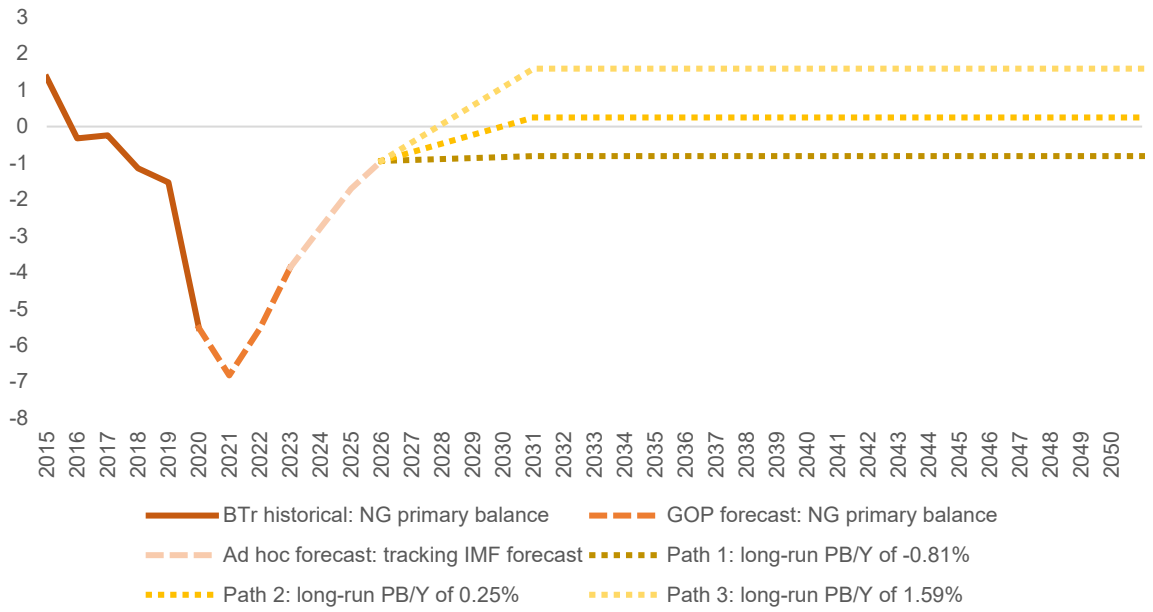
We calculate fiscal gaps for three alternative GDP growth rates (5%, 6%, and 7%) and three alternative real interest rates (2%, 3%, and 4%). Our growth scenarios encompass the DBCC's current GDP growth projections for 2023 and 2024 of 6-7 percent, plus a pessimistic scenario where real GDP grows at a slower rate of 5 percent, which is closer to the pre-pandemic average since 1986 (4.66%). In our interest rate scenarios, we treat 3 percent (which is close to 3.05%average of the real effective interest rate in 2016-2019) as the baseline, 2 percent (which is close to the 1.87%average in 1986-2019) as the optimistic scenario, and 4 percent as the pessimistic scenario.

We also compute fiscal gaps for three alternative trajectories of the primary balance, as illustrated in Figure 4.1. All three trajectories imply the government undertaking fiscal consolidation to bring the country's fiscal position to a pre-pandemic state. The three trajectories share a common path from 2021 through 2026 and diverge thereafter towards three long-run primary balance/GDP ratios.[23] These are: -

[23] For 2021 to 2023, we use projections of the primary balance in the government's 2022 Budget of Expenditures and Sources of Financing (BESF). Projections go up to 2023 only. For 2024 to 2026, we assume that the primary balance tracks the IMF's forecast path of the general government primary balance. We think this is a reasonable assumption as the two series have historically tracked each other closely. For 2027 to 2030, the three primary balance trajectories are assumed to diverge as they approach their long-run levels. We assume the transition paths to be linear for simplicity, reaching their long-run values in 2031, and remaining constant through 2051.

0.81 percent (the average in 2016-2019) for Path 1; 0.25 percent (the average in 2010-2019) for Path 2; and 1.68 percent (the average in 1986-2019) for Path 3.

Figure 4.1. Primary balance, historical and projected paths



Source: Bureau of Treasury, BESF 2022, CEIC, and authors' assumptions.

Table 4.1 presents fiscal gap estimates under different scenarios. Positive (negative) values represent required increases (reductions) in the primary balance and are shaded red (green). Generally, given a specific fiscal trajectory, the fiscal gap falls with higher GDP growth, lower interest rates, and a longer deadline for reaching the target debt ratio.

Table 4.1. Estimated annual fiscal gap from 2022 through terminal year

Long-run primary balance (percent of GDP)	Target debt ratio terminal year	g=5%			g=6%			g=7%		
		r=2%	r=3%	r=4%	r=2%	r=3%	r=4%	r=2%	r=3%	r=4%
-0.81 (Path 1)	2031	2.41	2.92	3.44	1.91	2.42	2.93	1.43	1.93	2.44
	2041	0.84	1.35	1.86	0.36	0.86	1.36	-0.10	0.38	0.87
	2051	0.33	0.83	1.34	-0.13	0.35	0.84	-0.58	-0.12	0.36
0.25 (Path 2)	2031	2.06	2.59	3.11	1.56	2.07	2.60	1.07	1.58	2.09
	2041	0.08	0.61	1.15	-0.42	0.10	0.62	-0.90	-0.40	0.11
	2051	-0.56	-0.04	0.50	-1.04	-0.54	-0.03	-1.51	-1.03	-0.53
1.59 (Path 3)	2031	1.62	2.16	2.70	1.11	1.64	2.17	0.60	1.13	1.65
	2041	-0.87	-0.31	0.25	-1.40	-0.85	-0.30	-1.90	-1.38	-0.84
	2051	-1.68	-1.12	-0.56	-2.19	-1.66	-1.11	-2.68	-2.17	-1.64

Source: Authors' calculations. Note: g = real GDP growth rate; r = real effective interest rate. Target debt ratio is 40 percent.

Overall, the range of fiscal gaps associated with a debt target deadline of 2031 is quite large for all three fiscal paths. Under the most benign consolidation path (Path 1), bringing the debt ratio down to 40 percent by 2031 would require annual primary balance increases in the range of 1.4 percent of GDP (in the most optimistic growth and interest rate scenario) to 3.4 percent of GDP (in the most pessimistic scenario) relative to its assumed trajectory starting 2022.

To illustrate the magnitude of these adjustments, the fiscal gap under the median GDP growth and real interest rate scenario, at 2.4 percent of GDP, is equivalent to about 17.4 percent of tax revenues or 11.3 percent of primary spending in 2020. Even for the most severe consolidation path (Path 3), the median scenario still yields a fiscal gap of 1.64 percent of GDP, roughly equivalent to 11.3 percent of tax revenues and 9.3 percent of primary spending in 2020.

Delaying the deadline to 2041 or 2051 results in significantly lower fiscal gap estimates. This is rather expected since by construction, all adjustments in our projected fiscal paths would have already occurred by the end of 2031. A 2041 deadline for Path 1 yields fiscal gaps in the range of -0.1 percent of GDP to 1.9 percent of GDP. This means that in the most optimistic scenario, the government can afford to run a smaller primary balance than the assumed path by 0.10 percent of GDP annually. Under the median scenario, the fiscal gap is 0.86 percent of GDP, equivalent to 5.9 percent of tax revenues or 4.8 percent of primary spending in 2020. Imposing longer debt deadlines for Paths 2 and 3 produces the same pattern of results, such that even less optimistic scenarios yield negative fiscal gap estimates. This indicates that under certain growth and interest rate conditions, the fiscal consolidations involved in Paths 2 and 3 exceed the size necessary for achieving the debt target over two or three decades.

To summarize, we use a simple framework to provide a range of estimates of the fiscal adjustment required for government debt to return to its immediate pre-pandemic level of 40 percent. Our results suggest that reaching the target debt ratio by 2031 may be difficult given the large fiscal adjustments that this would involve (1.4% to 3.4% of GDP for the gentlest fiscal consolidation path), on top of the adjustments implied by our assumed primary balance paths. As smaller fiscal gaps are associated with longer debt reduction time horizons, achieving the debt target later than 2031 appears more feasible, especially as there is need for further spending to prevent economic scarring.

Our approach has several limitations. One is that it does not consider feedback between macroeconomic variables, for instance, between government spending and GDP growth. Too much fiscal tightening can weaken growth and raise the debt/GDP ratio, undermining debt sustainability efforts. It also omits the impact of exchange rates. Although government debt is now largely domestically held, foreign debt still accounts for 30.3 percent of the total debt stock (based on 2021 figures). Moreover, our analysis does not capture the uncertainty of future economic conditions. While we present alternative scenarios, our approach gives no assessment of the likelihood of their occurrence. Given these, our results should be interpreted as indications of the fiscal challenge rather than as precise estimates.

5. Assessing public debt sustainability through fiscal reaction functions

Both standard DSA and fiscal gap analysis are useful for policymakers. The former helps by providing reasonable projections of the medium-term trajectory of public debt, while the latter supplies sensible estimates of the fiscal adjustments needed to meet a country's debt targets. Dependence on uncertain macroeconomic forecasts is a natural weakness, but the methods also hinge on indeterminate fiscal policy assumptions, providing limited information on how a country would move from one debt state to another, and, more specifically, on the dynamic path of fiscal balances.

A relatively simple and effective way to gain greater understanding of this path is through estimation of fiscal reaction functions. These attempt to specify the response of the primary balance to outstanding public debt, controlling for other influences, thus establishing how a government will likely react to its debt burden. They help account for systematic features of the policy process and can capture possible nonlinearities in government behavior.

Fiscal reaction functions have been widely used, as they aid in assessing fiscal sustainability in various settings. Understanding how government systematically responds to debt variations—whether they exert greater fiscal effort in the face of rising debt, and whether they intensify these efforts as debt escalates—is beneficial in evaluating policy and weighing whether a proposed fiscal consolidation strategy would be feasible (Burger et al. 2011). Such estimations improve forecasts of fiscal balances that are at the core of other methods designed to predict debt sustainability, adding realism to these methods as the reaction functions are either built on a country's policy track record or based on what similar countries were able to achieve or sustain in the past (Abiad and Ostry 2005, Celasun et al. 2006).

Because of the COVID-19 pandemic, fiscal reaction functions have become relevant again for many countries, as governments face mounting debt due to massive relief efforts and the need to spend more to support a delicate recovery and prevent economic scarring. They will continue to invite interest given the importance of ensuring consistency of fiscal policy with fiscal solvency against this backdrop. Such will be the case particularly for emerging market developing economies, which have lower revenues, less stable access to capital markets, and likely to suffer more painful adjustments. This motivates us in this final section to additionally estimate fiscal reaction functions for the Philippines and a group of ASEAN economies to gain deeper insight on public debt sustainability in the country.

5.1. Fiscal reaction functions for the Philippines

Building on the intuition of intertemporal fiscal solvency[24] (see Appendix A), the fiscal reaction function can be written as:

$$p_t = \alpha + \beta p_{t-1} + \rho d_{t-1} + \gamma X_t + \varepsilon_t$$

where p_t is the ratio of the primary balance to GDP at time t; d_{t-1} is the public debt-to-GDP ratio at time $t-1$ (lagged debt); X_t represents other determinants of the primary balance (namely, the output gap, various government spending measures, inflation, the real effective exchange rate or REER, the ratio of current account to GDP, foreign interest rates, and various crisis dummies); and ε_t is an error term.

Bohn (1998, 2008) showed that, in a linear fiscal reaction function, a positive and statistically significant response of the primary balance to outstanding debt is *sufficien*t to satisfy the government's

[24] A fiscally solvent government is expected to honor all (current and future) financial obligations and implies an implicit commitment to continue funding needed public goods, services, and transfers at any point in the future. Fiscal solvency thus requires that the present value of government revenues be enough to cover all government disbursements, or equivalently, that the present value of primary balances (the present value of future revenues net of non-interest spending) be enough to cover the existing public debt (Celasun et al. 2006).

intertemporal budget constraint (D'Erasmo et al. 2016). Such systematic behavior, according to Bohn, indicates responsible fiscal policy behavior and guarantees fiscal solvency.

5.1.1. Other determinants of the primary balance

Fiscal reaction functions typically include measures of temporary fluctuations of national output and government purchases as additional determinants of the primary balance—the output gap and public spending gap, respectively. In this paper, we use the cyclical component of GDP and public expenditures (in different forms) derived using the Hodrick-Prescott filter, which is the usual treatment in the literature.

The output gap is included to control for the effects of the business cycle. It allows for the possibility of government pursuing demand stabilization and controls for cyclical influences on its income and spending. A positive coefficient on the output gap indicates countercyclical fiscal policy (procyclical primary balances), while a negative coefficient indicates procyclical fiscal policy (countercyclical primary balances).

We consider two measures of short-term fluctuations in public spending: one is the cyclical component of real (non-interest) government expenditures, while the other is the cyclical component of real government consumption from the national income accounts. We also consider the log of real (non-interest) government expenditures as an alternate measure.[25] A negative coefficient is expected, as surprise increases (decreases) in public spending would tend to lower (raise) primary balances.

Following papers that estimate fiscal reaction functions especially for developing countries, we include the lag of the primary balance to capture inertia in fiscal policy behavior and persistence that may trace to public spending inflexibility. We also incorporate consumer price inflation in the main specification to control for inflation tax effects and other influences on the primary balance.

We include the REER and foreign interest rates (proxied by 3-month and 10-year Treasury rates representing the long and short ends of the yield curve) in our empirical specification (as in Lankester-Campos et al. 2020), the relevance of which are quite easy to note for an emerging market economy with both domestic-currency and foreign-currency denominated public debt. Following Mendoza and Ostry 2008, we include the current-account-to-GDP ratio to control for the effect of "twin deficits", the simultaneous occurrence of a fiscal deficit and an external deficit, reflected by a positive coefficient on the current account variable in the estimated fiscal reaction function.

Since extreme events may mask the relationship between the primary balance and outstanding debt in the Philippines, dummy variables for certain years are adopted in the estimation. These comprise the following crisis episodes: (i) the 1991 recession in the country; (ii) the Asian financial crisis (1998); (iii) the global financial crisis (2009); and (iv) the COVID-19 public health and economic crisis (2020). Finally, given evidence of nonlinearity in fiscal reaction functions in similar research, we consider a specification that includes a spline for public debt at a target or threshold level set at the sample mean.

5.1.2. Single-country estimation and robustness checks

A few studies have estimated fiscal reaction functions for a single (developing) country (such as Burger et al. 2011 for South Africa and Lankester-Campos et al. 2020 for Costa Rica), but none yet for the Philippines. The latter has been included in various developing economy and world panels, however (e.g., Abiad and Ostry 2005, Mendoza and Ostry 2008, Paret 2017). The advantage of single-country

[25] D'Erasmo et al. (2020) note that since the primary balance is the difference between total revenues and expenditures net of interest payments, including non-interest government spending in the regression suggests that revenues may be the only endogenous component of the dependent variable that can respond to debt. Using the cyclical component of the series helps address this issue, though potential limitations remain.

analysis is that it evaluates fiscal reactions particularly for the Philippines, instead of considering homogeneous responses for a panel of similar countries. The downside is the use of a relatively short time series, given scarcity of budgetary data, which often limits one to the use of annual frequency—in any case, more meaningful than higher frequency data considering most countries' budget procedures—and cross-country samples to obtain greater data variation (Celasun et al. 2006).

To mitigate this weakness, we considered a wide range of specifications to test the strength of our estimation results. Robustness checks include the use of alternative measures for public spending (non-interest expenditure as a share of GDP) and the REER (the cyclical component of the series based on an HP filter); alternate use of long and short yields (i.e., separate runs for the 3-month US Treasury bill and the 10-year US Treasury note) and various thresholds for public debt in the spline regressions (at 40%, 45%, 50%, 55%, and 60%); and the exclusion of extreme COVID-19 crisis observations.[26] These various specifications failed to change the general results. We also considered a linear time trend and a cubic specification (to capture nonlinearity), but these were not statistically significant.[27]

5.1.3. Data and estimation

We use annual Philippine data from the Bureau of Treasury, Philippine Statistics Authority, Bangko Sentral ng Pilipinas, and CEIC, and US Treasury yields data from FRED (Federal Reserve Bank of St. Louis). The sample period spans 1986—the year when fiscal accounts data from the Bureau of Treasury starts—to 2020. Government debt, government spending, primary balance, and current account are all scaled by GDP. The output gap, real government non-interest expenditure gap, and government consumption gap were constructed as the percentage difference of the original series with the Hodrick-Prescott trend (obtained using a smoothing parameter value of 100). Table 5.1 provides the descriptive statistics of the variables used in the regressions.

Table 5.1. Summary statistics: Philippines, annual

	N	Mean	Std. Dev.	min	Median	max
Primary balance/GDP	35	1.385	2.117	-5.525	1.387	4.937
Debt/GDP	35	52.641	8.443	39.611	51.94	71.601
Output gap	35	.016	2.747	-7.687	-.296	6.346
Real gov't non-int, exp.	35	1,309,968	838185.81	474348.16	993915.13	3758779
Gov't non-int. exp./GDP	35	13.246	2.108	9.909	12.918	21.445
Real gov't non-int. exp. gap	35	.053	6.469	-12.421	.916	15.122
Gov't consumption/GDP	35	12.043	1.398	9.84	11.864	15.136
Gov't consumption gap	35	-.062	3.996	-6.231	-.318	8.494
Current account/GDP	35	-.035	3.11	-5.336	-.376	5.455
Real effective exchange rate	35	97.856	10.111	76.014	98.756	115.997
CPI inflation	35	5.972	4.145	.659	5.202	19.325
US Treasury rate: 3-month	35	3.173	2.554	.033	3.213	8.393
US Treasury rate: 10-year	35	4.845	2.274	.894	4.629	8.846

Sources: Bureau of Treasury (2021), Philippine Statistics Authority (2021), Bangko Sentral ng Pilipinas (2021), CEIC (2021), and FRED (2021).

Table 5.2 summarizes the results for the various specifications estimated. Columns (1) to (3) consider only the basic specification that includes the lag of the primary balance (as share of GDP), the lag of outstanding public debt (as share of GDP), the output gap, the various proxies for public spending, and the dummy variables for crisis episodes. Columns (4) to (6) incorporate the other determinants of the primary balance (inflation, REER, the ratio of the current account to GDP, and the US Treasury rates),

[26] Results of these regressions are not shown because of space considerations but may be requested from the authors.

[27] Lack of data observations prevented us from using alternative econometric methods apart from OLS, such as threshold autoregression (to allow for nonlinearity) or vector error-correction model estimation in the event of nonstationarity and possible cointegration of time series.

while Columns (7) to (9) consider (nonlinear) spline regressions with the threshold for debt estimated at the sample mean.

In the regressions, the coefficients associated with lagged primary-balance-to-GDP ratio are always positive and statistically significant, indicating a high degree of inertia. *This suggests that, on average, fiscal policy is persistent*.

We also find empirical evidence of the responsiveness of primary balances to public debt, with fiscal policy tightening when debt conditions worsen, and vice versa. *Positive and statistically significant coefficients on lagged debt in most specifications imply fiscal policy that is generally consistent with a desire to achieve fiscal solvency*.

The range of the parameters (0.06 to 0.09) is similar to, though slightly higher than, those observed for most emerging market country panels.[28] Having a negative interest rate-growth differential (interest rate less the GDP growth)—which has been the case historically (on average) in the Philippines (see Figure 2.8) and may remain so when growth rates recover after the pandemic—further confirms fiscal behavior that ensures debt sustainability.[29]

The output gap parameter is neither consistent in sign nor statistically significant, implying that *the government does not systematically respond to the business cycle, whether counter-cyclically or pro-cyclically*. Mixed results have also been observed in previous studies (see Paret 2017).

As expected, surprise increases in public spending correlate with a deterioration in primary balances, while surprise declines correlate with fiscal improvement. The result is strong for the real non-interest expenditure gap variable, but not the government consumption gap, though the coefficients attached to the latter are consistently negative. In contrast, the parameters for the log of real non-interest government spending are not significant or consistent in magnitude and sign, respectively, in most regressions.

Inflation is not statistically significant in any estimation, but the REER parameters are all positive and significant, suggesting that fiscal authorities capitalize on real appreciation and the forces supporting it to build up primary balances and reduce debt. Of the global interest rates, only the long-term foreign-currency rate (proxied by the 10-year US Treasury yield) is statistically significant, though not in all regressions. *The associated coefficient is consistently positive, which suggests that fiscal policy responds systematically to rising interest costs*. Similar behavior has been observed in a few other emerging market economies, where governments may build up primary balances beyond the level required to stabilize debt during periods of elevated funding costs (e.g., Burger et al. 2011).

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[28] Emerging market economies typically exhibit a stronger fiscal response to debt than industrial economies. Mendoza and Ostry (2008) argue that higher coefficients on debt do not imply "more sustainable" fiscal policies—rather, a stronger conditional response in such countries reflects stronger and more pervasive asset market frictions and riskier fiscal environments.

[29] The debt-stabilizing primary balance can be derived as $p_t = \left(\frac{r-g}{1+g}\right) d_{t-1}$, where d is the debt-to-GDP ratio, r is the real interest rate, and g is the real GDP growth rate. Hence, the primary balance behaves in line with debt sustainability in the short run if $\rho \geq \left(\frac{r-g}{1+g}\right)$, where $\rho = \frac{\partial p_t}{\partial d_{t-1}}$ from the fiscal reaction function, and in the long run if $\frac{\rho}{1-\beta} \geq \left(\frac{r-g}{1+g}\right)$. With little need for elaborate calculations, a negative interest rate-growth differential $(r-g)$ virtually guarantees this if ρ is positive and statistically significant. For a country with external debt, the debt-stabilizing primary balance can be further expanded to include the effects of exchange rate changes (Appendix XX), where the denominator remains positive and the numerator can be written as $(\hat{r}-g) + \theta\varepsilon(1+r_f)$, with $\hat{r}$ being a real effective interest rate (weighted average of domestic and foreign interest rates based on the currency composition of public debt), θ being the share of foreign-currency-denominated public debt, ε representing exchange rate depreciation, and r_f representing the foreign interest rate. A negative interest rate-growth differential supports fiscal sustainability, but domestic currency depreciation may conceivably overpower its effects.

We observe a robust positive relationship between primary balances and the current account, indicative of "twin deficits" where a higher fiscal deficit occurs alongside a higher current account deficit.[30] Among the crisis episodes, the biggest shock to primary fiscal balances has clearly been the COVID-19 crisis, as evidenced by the positive, large, and statistically significant coefficients (visualized in Figure 2.1).

The final result comprises the consistently positive spline regression coefficients, with the debt target or threshold placed at the sample mean (computed at 52.6%), although the parameter is statistically significant in just one out of three specifications.[31] This is similar to the finding of Bohn (1998, 2008) for the US, where fiscal effort had been observed to increase with debt above comfortable levels, but runs counter to the results for developing country panel regressions, which generate negative and significant coefficients at a 50 percent debt spline (e.g., Abiad and Ostry 2005, Mendoza and Ostry 2008, Celasun et al. 2006). Estimating an instrumented quantile fiscal reaction function for emerging market countries, Paret (2017) offers a nuanced result where the responsiveness of a country's fiscal policy increases with its financing needs.

The finding for the Philippines may likewise imply greater fiscal effort as debt worsens or may be an artifact of the limited dataset and range of experience, especially regarding public debt, captured in our sample and not just a matter of country heterogeneity. We therefore estimate fiscal reaction functions for a wider group of Asian economies with arguably similar characteristics (say, geography and economic development). Specifically, we estimate reaction functions for a panel of ASEAN-5 economies that, apart from the Philippines, include Indonesia, Malaysia, Thailand, and Viet Nam.

5.2. Fiscal reaction functions for ASEAN-5

We apply a similar set of specifications for the ASEAN-5 economies, though we also show a set of regressions that include a linear time trend, which is significant in the cross-country (fixed effects) panel regressions. We likewise conduct robustness checks to confirm the results.[32]

We use annual data from the IMF World Economic Outlook and Bruegel to construct an unbalanced panel dataset of ASEAN-5 countries. The data spans 1991-2020 for Malaysia, 1994-2020 for the Philippines, and 2011-2020 for Indonesia, Thailand, and Vietnam. Table 5.3 provides descriptive statistics for some of the variables used.

[30] While theoretical work emphasizes causality running from budget deficits to current deficits, reverse causality has been empirically shown— when countries target the current account (Summers 1988) and for net debtor developing countries with limited resources and requiring external funds (Reisen 1998, Khalid and Teo 1999) and commodity-based exporters (Alkswani 2000, Sobrino 2013). Anoruo and Ramchander (1998) find Granger causality running from trade deficits to fiscal deficits for five developing economies of Asia—India, Indonesia, South Korea, Malaysia, and the Philippines.

[31] We find similar results and the best fit (high R-squared) in the robustness checks when the thresholds are set at 50 percent and 55 percent.

[32] Again, results are not shown to conserve space but may be requested from the authors.

Table 5.2. Summary statistics: ASEAN-5, annual

		Indonesia	Malaysia	Philippines	Thailand	Vietnam
Primary balance/GDP	N	20	30	27	20	20
	Mean	0.47	-0.26	2.01	0.30	-1.57
	SD	1.87	3.49	1.84	2.19	1.73
	Min	-3.83	-4.89	-3.92	-5.51	-4.76
	Max	3.85	6.76	4.56	3.25	0.79
Debt/GDP	N	20	30	27	20	20
	Mean	35.63	46.94	51.90	43.46	37.03
	SD	14.30	10.49	10.34	5.58	7.36
	Min	22.96	29.62	36.97	34.95	25.42
	Max	73.70	67.43	71.39	57.47	47.64
Expenditure/GDP	N	20	30	27	20	20
	Mean	17.84	25.44	19.54	21.31	22.00
	SD	0.99	2.35	1.85	1.89	1.68
	Min	16.38	21.16	17.14	18.29	19.19
	Max	19.51	30.89	26.38	25.71	24.97
Expenditure gap	N	20	30	27	20	20
	Mean	0.03	0.03	0.00	0.01	0.09
	SD	5.14	5.13	4.12	6.59	5.30
	Min	-7.63	-9.46	-8.51	-10.50	-7.92
	Max	11.65	10.87	7.91	22.50	9.22
Gov't consumption gap	N	20	30	27	20	20
	Mean	0.03	0.01	-0.08	0.00	0.14
	SD	3.11	5.76	6.25	2.36	3.87
	Min	-5.82	-17.06	-12.62	-3.84	-6.00
	Max	5.04	9.78	16.57	5.86	8.53
Output gap	N	20	30	27	20	20
	Mean	0.05	0.00	0.03	-0.02	0.09
	SD	1.80	3.25	2.85	2.19	1.55
	Min	-3.12	-5.42	-7.68	-5.38	-2.14
	Max	4.76	9.12	6.35	3.06	3.94

Sources: IMF World Economic Outlook and Bruegel.

Table 5.4 shows similar results for the wider group of ASEAN-5 countries. Positive and significant coefficients on lagged primary balances indicate strong persistence in fiscal behavior, while positive and significant parameters on lagged public debt in the same range as previously estimated for the Philippines (0.04 to 0.08) indicate policy directions in the region that are consistent with a desire to satisfy fiscal solvency constraints. The latter result is in line with observations of Ferrarini and Ramayandi (2012, p. 60) for seven Asian economies (including the Philippines).[33] The authors state that their regression "unambiguously corroborates the presence of a profoundly responsible and prudent conduct of fiscal policy in the region, which tends to keep debt ratios generally low, or keeps them from rising uncontrollably at higher levels."[34]

Like the results of our single-country analysis, temporary fluctuations in real non-interest government purchases in ASEAN-5 economies tend to disturb primary balances, with surprise increases in public expenditures serving to reduce surpluses or worsen deficits, while inflation similarly has no correlation with primary balances. The fiscal impact of the Asian financial crisis is more pronounced for the broader ASEAN panel than the Philippines alone, but the COVID-19 crisis seems less so. While still positive

[33] Their country sample includes the People's Republic of China, South Korea, India, Indonesia, Malaysia, the Philippines, and Thailand for the years 1990 to 2010.
[34] Econometric techniques they used to compute fiscal reaction functions for Asia include FGLS, OLS, and SGMM on linear and cubic specifications.

and significant in some estimations, the relationship between long-term global interest rates as proxied by 10-year US Treasury yields is less clear.

The biggest differences in results relate to the REER, which is no longer statistically significant, though still consistently positive; and the current-account-to-GDP ratio and spline regressions, relevant parameters of which now take the opposite sign. The Philippines has the second highest proportion of external debt in total government debt in the ASEAN-5, except for Viet Nam (see Figure 2.5), which helps explain the findings on the REER. Rather than "twin deficits," the results (negative and significant coefficients on the ratio of the current account to GDP) indicate a "twin divergence" as originally observed by Kim and Roubini (2008) for the US, where output shocks appear to drive the (negative) co-movement of the fiscal and current account balances.

The negative and significant spline regression coefficients for ASEAN-5 are in line with the literature for developing countries and reflect a weakening of the fiscal response to debt when the ratio of debt to GDP exceeds a certain level (in the current panel regressions, above the country mean). This suggests natural limits to generating primary surpluses, which become increasingly difficult to raise especially as interest payments balloon and the room for tax and spending improvement shrinks.

Ghosh et al. (2013) note that "fiscal fatigue" sets in when the response of the primary balance to rising debt fails to match the interest rate-growth differential—this implies a finite debt limit, the run-up to which may be characterized by a sudden jump in financing costs, with markets likely to anticipate unsustainable fiscal conditions. They were able to estimate such an empirical phenomenon for advanced economies using a cubic function, which also allowed them to create a valid measure of fiscal space. Such specifications for fiscal reaction functions, however, have tended to have poorer statistical fit when applied to developing country panels (e.g., see Abiad and Ostry 2005).

5.3. Implications for fiscal sustainability in the Philippines

Taken in this context, the earlier result for the Philippines (zero to positive spline regression coefficients) may be indicative of still sanguine fiscal conditions, particularly if the ratio of public debt to national output stays within its range of (recent) historical experience. As shown earlier in this paper, the country's debt tended to climb with every recession, but government eventually managed to generate primary surpluses and fiscally consolidate, albeit with a lag.

External debt exceeded 80 percent of GNP in 1984, the lion's share tracing to the public sector, which inevitably required a painful economic adjustment (Dohner and Intal 1989). Yet in the sample used to estimate the Philippine fiscal reaction function (from 1986 to 2020), national government debt levels peaked at slightly above 70 percent of GDP in 2004, after which it sharply declined (for a few years following a major VAT reform, during a period marked by moderate but steady growth and sharp domestic currency appreciation) and then slowly dipped until it went below 40 percent of GDP in the couple of years prior to the COVID-19 pandemic.

Overall, the empirical exercise in this section reveals behavior compatible with a desire to satisfy an intertemporal budget constraint (i.e., to maintain fiscal solvency). Thus, governments in ASEAN-5, including the Philippines, appear to be acting in ways that minimize the likelihood of a future debt crisis.

However, the results also indicate declining capacity in the region to improve fiscal balances as debt escalates, perhaps given the political and institutional limits to doing so. Empirical findings for the Philippines in this regard, while not fully conclusive, nonetheless suggest an inclination to intensify efforts to protect fiscal conditions as debt mounts, to within a reasonable range, rather than the reverse

case.[35] Provided there is no structural break in relation to fiscal policies and institutions, one can expect the same set of responses to debt developments in a post-COVID-19 setting. Major fiscal policy and related changes—and especially policy reversals—therefore need to be carefully considered.

Within this framework, a sound fiscal track record, by helping allay concerns about sovereign risk, should also help raise debt limits (i.e., widen fiscal space), which would be useful when one needs to continue supporting a fragile economic recovery. Similar dynamics also justify the importance of a sound fiscal consolidation strategy if one wants to prevent an escalation of financing costs from derailing growth.

[35] Among the ASEAN-5 economies, the Philippines notably has, based on historical average, the highest debt-to-GDP ratio but also the highest primary balances (Table 5.3)

Table 5.3. Fiscal reaction functions for the Philippines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lagged primary balance/GDP	0.596***	0.705***	0.725***	0.368**	0.440***	0.415***	0.332**	0.444***	0.431***
	(4.19)	(5.74)	(4.82)	(2.33)	(3.82)	(3.33)	(2.23)	(3.83)	(3.51)
Lagged debt/GDP	0.034	0.063***	0.064***	0.074**	0.078**	0.089***	-0.077	0.031	0.004
	(1.39)	(3.13)	(3.04)	(2.15)	(2.72)	(3.31)	(1.06)	(0.42)	(0.05)
Debt spline at mean							0.191**	0.062	0.109
							(2.10)	(0.64)	(1.16)
Output gap	-0.011	0.048	-0.028	0.085	0.052	0.045	0.020	0.001	-0.043
	(0.19)	(0.70)	(0.37)	(0.73)	(0.73)	(0.57)	(0.16)	(0.01)	(0.33)
Log of real gov't non-interest exp.	-1.048*			-1.137			-2.677		
	(1.83)			(0.73)			(1.69)		
Real non-interest exp. gap		-0.080**			-0.066*			-0.053	
		(2.41)			(1.83)			(1.19)	
Gov't consumption gap			0.001			-0.098			-0.061
			(0.02)			(1.59)			(0.91)
CPI inflation				0.020	-0.039	0.016	0.040	-0.027	0.018
				(0.21)	(0.43)	(0.17)	(0.43)	(0.31)	(0.20)
Real effective exchange rate				0.081**	0.062**	0.098***	0.088***	0.064**	0.088***
				(2.25)	(2.29)	(3.12)	(2.99)	(2.52)	(3.14)
Current account/GDP				0.177**	0.097	0.170**	0.200**	0.125*	0.194**
				(2.14)	(1.40)	(2.11)	(2.56)	(1.96)	(2.41)
US Treasury yield: 3-month				-0.090	-0.040	0.059	0.078	-0.017	0.059
				(0.40)	(0.22)	(0.27)	(0.32)	(0.08)	(0.30)
US Treasury yield: 10-year				0.273	0.453*	0.400	-0.087	0.482*	0.473*
				(0.51)	(1.80)	(1.40)	(0.17)	(1.98)	(1.87)
1991 Recession	0.578	1.312***	1.158***	0.622	1.282	0.652	0.342	1.034	0.437
	(1.56)	(5.57)	(4.28)	(0.56)	(1.03)	(0.57)	(0.30)	(0.88)	(0.37)
Asian Fin. Crisis (1998)	-0.922***	-0.396	-0.719	-0.673	-0.097	0.106	-1.261*	-0.320	-0.372
	(3.50)	(1.40)	(1.62)	(1.10)	(0.17)	(0.14)	(1.88)	(0.51)	(0.43)
Global Fin. Crisis (2009)	-2.248***	-1.741***	-2.664***	-2.254***	-1.457*	-1.720**	-1.634**	-1.567*	-1.842***
	(6.02)	(3.65)	(6.55)	(3.49)	(1.99)	(2.68)	(2.38)	(2.04)	(3.24)
COVID-19 Crisis (2020)	-3.704***	-3.066***	-4.317***	-3.546***	-3.209***	-3.449***	-4.712***	-4.036*	-4.830**
	(5.29)	(3.55)	(3.60)	(3.10)	(3.33)	(3.16)	(3.34)	(2.08)	(2.50)
Constant	13.525	-2.892***	-2.851**	5.539	-9.903***	-13.670***	34.911	-8.055*	-9.060*
	(1.49)	(2.86)	(2.75)	(0.24)	(2.99)	(3.66)	(1.40)	(2.06)	(1.90)
Adjusted R2	0.82	0.83	0.77	0.86	0.89	0.87	0.89	0.89	0.88
N	34	34	34	34	34	34	34	34	34

The dependent variable is the primary balance as share of GDP. Figures in parentheses are t-statistics; robust standard errors used.

Table 5.4. Fiscal reaction functions for ASEAN-5

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged primary balance/GDP	0.658**	0.401**	0.406**	0.538**	0.394**	0.400**
	(3.97)	(3.49)	(3.38)	(3.09)	(3.68)	(3.56)
Lagged debt/GDP	0.040*	0.044**	0.066***	0.034	0.042**	0.077**
	(2.63)	(3.80)	(4.79)	(1.45)	(3.11)	(4.49)
Debt spline at mean			-0.038*			-0.059*
			(2.13)			(2.30)
Output gap	0.107	0.064	0.068	0.152*	0.118	0.132*
	(2.06)	(1.08)	(1.17)	(2.60)	(1.90)	(2.43)
Real non-interest exp. gap	-0.120*	-0.149**	-0.150**	-0.133*	-0.153**	-0.155**
	(2.32)	(3.29)	(3.26)	(2.44)	(3.32)	(3.33)
CPI inflation		0.071	0.067		0.062	0.054
		(1.45)	(1.30)		(1.25)	(1.05)
Real effective exchange rate		0.023	0.022		0.025	0.024
		(1.57)	(1.46)		(1.84)	(1.73)
Current account/GDP		-0.128***	-0.126**		-0.118***	-0.114**
		(4.79)	(4.59)		(4.70)	(4.40)
US Treasury yield: 10-year		0.334*	0.339*		-0.079	-0.136
		(2.33)	(2.14)		(0.35)	(0.59)
Asian fin. crisis (1998)	-1.896	-0.916	-0.866	-2.042	-1.104**	-1.056*
	(1.22)	(1.97)	(1.80)	(1.90)	(3.03)	(2.75)
Global fin. crisis (2009)	-1.696**	-0.773	-0.787	-1.464**	-0.753	-0.770
	(3.87)	(1.39)	(1.37)	(3.15)	(1.30)	(1.27)
Covid-19 crisis (2020)	-2.296**	-1.533	-1.496	-1.284	-1.383	-1.302
	(3.68)	(1.65)	(1.62)	(1.61)	(1.70)	(1.70)
Linear time trend				-0.079*	-0.096*	-0.111*
				(2.74)	(2.25)	(2.60)
Constant	-1.650*	-5.428*	-6.206**	0.137	-2.263	-2.971*
	(2.37)	(2.60)	(3.03)	(0.11)	(1.56)	(2.16)
Adjusted R2	0.74	0.82	0.82	0.77	0.83	0.83
N	110	110	110	110	110	110

The dependent variable is the primary balance as share of GDP. Panel regressions include country fixed effects. Figures in parentheses are t-statistics; robust standard errors used.

6. Conclusions

This paper sought to address the question of whether the national government's current level of debt, given its fiscal policy and plans, remains on a sustainable path. The following are the key findings.

In our analysis of the immediate impact of the COVID-19 pandemic and related fiscal responses on the Philippines' public finances within a historical frame, the most recent debt surge in the country appears less worrisome than earlier debt episodes in that it is not due to sharp interest rate shocks, excessive external debt, or a buildup of hidden (non-budget) deficits, nor a steady decline in the country's tax effort. Instead, debt decomposition shows the surge was driven by an exogenous (pandemic-induced) drop in output growth and a resultant rise in primary deficits as revenues temporarily collapsed and relief and recovery spending by government accelerated. Under current conditions, the private sector's medium-term fiscal outlook does not differ much from that of the public sector—the consensus view is that GDP growth will normalize (to pre-pandemic levels by 2022), fiscal deficits will trend downwards, and interest-growth differentials will remain negative, generating favorable conditions for debt reduction in the near to medium term.

Using the IMF's DSA framework to calculate the country's medium-term debt trajectory, we find that the national government debt-to-GDP ratio may remain elevated in the medium-term, peaking at 66.8 percent in 2024 and dipping to 65.7 percent by 2026. However, since half of the accumulated debt during the height of the pandemic crisis (6.3 out of the 15-percent-of-GDP increase in 2020) comprised cash buffers of government that were built up in the event of a prolonged pandemic (and to benefit from loose monetary conditions), with such behavior continuing to the present, the scope for a future debt decline is wide. Netting the government's cash reserves, the debt-to-GDP ratio would follow a similar but much lower trajectory.

In our fiscal gap analysis, we find that even assuming the gentlest path of fiscal rectitude, our estimates of the primary balance adjustments needed to bring the debt ratio to pre-pandemic levels by 2031 are in the range of 1.4 to 3.4 percent of GDP (from most optimistic to most pessimistic scenarios). Extending the time horizon for reaching the debt target results in lower fiscal gaps, and therefore the required primary balance adjustments, to -0.10 (a reduction) to 1.9 percent of GDP with 2041 as the terminal year, and to -0.58 (a reduction) to 1.3 percent of GDP based on 2051 as the end date. The results suggest that it may not be feasible to immediately aim for a low debt ratio to give the economy time and room to recover from the pandemic shock, but nonetheless underscores the importance of a sound medium- to long-term fiscal consolidation plan.

Meanwhile, estimation of fiscal reaction functions reveals positive and statistically significant coefficients on lagged debt in the range of 0.06 to 0.09 for the Philippines, slightly higher than seen in the literature on emerging market countries, and 0.04 to 0.08 for the whole of ASEAN-5. This indicates that the Philippines and its ASEAN peers respond to rising indebtedness by improving primary balances. In the literature, such systematic behavior indicates responsible fiscal policy and already guarantees fiscal solvency. It is therefore crucial that fiscal policy reforms, especially those that were hard-won, remain intact.

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Appendix A. Basic debt dynamics

How is public debt estimated? Intuitively, public debt in any year (which is a stock variable that is measured at a given point in time) is affected by the existing public debt at the start of that period and the need to borrow through debt issuances (which increases public debt) less amortization payments (which decreases public debt) in that same period. If debt issuances exceed amortization payments, this would increase public debt (the extent by which depends on the existing debt stock at the start of the period for which debt is being measured) (IMF 2020).

What affects the need to borrow (represented by debt issuances)? Debt issuances will be determined by the government's gross financing needs defined for any period to be the difference between the government's amortization payments and its fiscal balance (or government revenues less expenditures) and other flows. From this we can project debt in period t, $Debt_t$, to be a function of existing debt at the end of period *t-1*, $Debt_{t-1}$, government's fiscal policy, *Fiscal Balance (revenues less expenditures)* and financing policies (or other net debt-creating flows)[36]:

$$Debt_{(t)} = Debt_{(t-1)} - Fiscal\ Balance_{(t)} + Other\ Flows_{(t)} \quad (1)$$

If government incurs a fiscal deficit in period *t*, this would increase public debt, ceteris paribus. Some examples of other transactions that may impact debt creating flows (that are not accounted for as budget expenditures) could be national government (NG): (1) borrowing to finance net acquisition of assets, negative if NG sells liquid assets); (2) realization of contingent liabilities; and, (3) debt relief which would decrease NG debt.

Public debt is also impacted by the exchange rate and the consequent valuation effect for governments with more exposure to foreign-currency debt. If a government has foreign debt, and the country's currency is expected to depreciate in year *t*, public debt will increase through the *Valuation Effect* (Equation [2]).

$$Debt_{(t)} = Debt_{(t-1)} - Fiscal\ Balance_{(t)} + Other\ Flows_{(t)} + Valuation\ Effect_{(t)} + Stock - Flow\ Adjustment_{(t)} \quad (2)$$

$$D_{t+1} = (1 + \varepsilon_{t+1}) * \left(1 + i^f_{t+1}\right) * D^f_t + (1 + i^d_{t+1}) * D^d_t - PB_{t+1} + O_{t+1} + RES_{t+1}$$

$$\text{where, } 1 + \varepsilon_{t+1} = \frac{e_{t+1}}{e_t}$$

In addition to this valuation effect, there is also the stock-flow adjustment due to intra-period exchange rate fluctuations which captures the new issuances of and amortization of foreign debt. This stock-flow adjustment is defined to be the difference between foreign currency issuances and amortizations valued to capture the intra-year exchange rate fluctuation[37] (IMF 2020). Taking into account stock-flow adjustments, Equation (2) can be expanded to Equation (3):

[36] This uses the IMF borrowing-requirements approach which is equivalent to the debt-issuances approach of projecting public debt based on net debt issuances (i.e., the difference between debt issuances and amortization payments). See IMF 2019.

[37] IMF 2020 defines the stock-flow adjustment equation to be $Stock - flow\ Adjustment_{(t)} = \left(Foreign - Currency\ Debt_{(t)} - Foreign\ Currency\ Amortizations_{(t)}\right) * \left(Exchange\ rate_{(t,eop)} - Exchange\ rate_{(t,avg)}\right)$

$$Debt_{(t)} = Debt_{(t-1)} - Fiscal\ Balance_{(t)} + Other\ Flows_{(t)} + Valuation\ Effect_{(t)} + Stock - Flow\ Adjustment_{(t)} \quad (3)$$

$$\frac{D_{t+1}}{Y_{t+1}} = (1 + \epsilon_{t+1}) * \left(1 + i^{f}_{t+1}\right) * \frac{D^{f}_{t}}{Y_{t+1}} + (1 + i^{d}_{t+1}) * \frac{D^{d}_{t}}{Y_{t+1}} - \frac{PB_{t+1}}{Y_{t+1}} + \frac{O_{t+1}}{Y_{t+1}} + \frac{RES_{t+1}}{Y_{t+1}}$$

Redefining fiscal balance to be the sum of the primary balance and interest expenses we get Equation (4) that identifies the key contributors to changes in debt:

$$Debt_{(t)} = Debt_{(t-1)} - Primary\ Balance_{(t)} + Interest\ Expense_{(t)} + Other\ Flows_{(t)} + Valuation\ Effect_{(t)} + Stock - Flow\ Adjustment_{(t)} \quad (4)$$

In words, public debt will increase with increases in interest expense, other flows, valuation effect and stock-flow adjustments and decrease with a primary balance. Interest expense is the sum of interest on both local and foreign debt (expressed in local currency using the average exchange rate for the period). The effective interest rate of domestic and foreign currency debt is computed as the interest expense for year *t* divided by public debt stock at the end of the previous year, *t-1*.

An alternative way of examining debt sustainability is looking at public debt relative to the capacity to repay debts. Redefining Eqn.4 above by dividing across with nominal GDP and simplifying we get Equation (5):

$$Change\ in\ \frac{Debt}{GDP}_{(t)} = \frac{(Debt_{(t)} - Debt_{(t-1)})}{GDP_{(t)}} - \frac{Debt}{GDP}_{(t-1)} * \frac{GDPGrowth_{(t)}}{(1+GDPGrowth_{(t)})} \quad (5)$$

The first term measures the effect of the change in public debt stock on the debt to GDP ratio while the second term captures the impact of an increase in nominal GDP on the same. For example, an increase in public debt stock would cause the debt to GDP ratio increase while an increase in nominal GDP causes a decrease, the net effect would depend on the magnitude of either changes. A good indication of sustainable debt is the increased capacity of government to repay debt.

Appendix B. IMF-DSA template data sources

Input	Variable	Data and Assumptions
Public Sector Data (2010-2027 in NC billions, unless otherwise specified)	GDP at constant prices	2010-2020 – World Bank 2021 – EPM 2022-2027 – FocusEconomics (Feb. 2022)
	GDP deflator (level) – Index number	2010-2026 – WEO 2027 – Computed using the same inflation as 2026
	GDP at current prices	2010-2027 – Computed using GDP at constant prices and GDP deflator
	Balance on current account (USD billions; 2020-2021. Required only for Higher Scrutiny countries).	2020-2021 – FocusEconomics (Feb. 2022)
	Nominal exchange rate-average (NC/USD-average)	2010-2021 – BSP 2022-2026 – FocusEconomics (Feb. 2022) 2027 – assumed same as 2026
	Nominal exchange rate-end of period (NC/USD – end of period)	2010-2021 – BSP 2022-2026 – FocusEconomics (Feb. 2022) 2027 – assumed same as 2026
	Real exchange rate index (NC/USD; Required only for Higher Scrutiny countries).	2010-2021 – BSP 2022-2026 – FocusEconomics (Feb. 2022) 2027 – assumed same as 2026
	Public sector non-interest revenues and grants	2010-2023 – BESF 2024 – Total revenues less interest revenues and privatization (DBCC MT Fiscal Program) 2025-2027 – maintained at 15.9% of GDP
	Public sector interest revenues	2010-2023 – BESF 2024-2027 – maintained at 0.034% of public sector revenues and grants
	Public sector non-interest expenditures	2010-2023 – BTr; BESF 2024 – Computed using % of GDP from MT Disbursement Program FY2022 BESF 2025-2027 – maintained at 17.6% of GDP
	Public sector interest expenditures (historical only; 2010-2021)	2010-2020 – BTr 2021 – BESF
	Public sector interest expenditures denominated in local currency (historical only; 2010-2021)	2010-2020 – BTr 2021 – BESF
	Public sector interest expenditures denominated in foreign currency (historical only; 2010-2021)	2010-2020 – BTr 2021 – BESF
	Public sector principal payments (historical only; 2010-2021)	2010-2020 – BTr 2021 – BESF
	Public sector debt service (historical only; 2010-2021)	Sum of interest and amortization payments 2010-2021 – BESF
	Cyclically adjusted primary balance	
	Recognition of implicit contingent liability	
	Other debt flows (+ increases financing needs)	2010-2021 – Budgetary Change in Cash (BESF)

Input	Variable	Data and Assumptions
		2022-2023 – Approximated at PhP300 billion 2024-2027 – Approximated at PhP200 billion
	External debt; short-term, on original maturity basis, private and public (2020-2021. Required for Higher Scrutiny countries)	
	Amortization of MLT external debt, private and public (2020-2021. Required for Higher Scrutiny countries)	
Historical Debt Data (in billions LCU; 2010-2021)	Stock of total public debt	BTr; Total sum of outstanding debt
	Short-term debt	BTr; Maturity of one year of less
	Long-term debt	BTr; Maturity of more than one year.
	Denominated in local currency	2010-2012 – FSH 2013-2021 – BTr
	Denominated in foreign currency	2010-2012 – FSH 2013-2021 – BTr
	Domestic Debt	2010-2012 – FSH 2013-2021 – BTr Based on residency criterion.
	External Debt	2010-2012 – FSH 2013-2021 – BTr Based on residency criterion.
Banking Sector Data	Private sector credit (Percent of GDP; 2018 to 2021)	2018-2021 – BSP
	Bank gross foreign assets (Percent of GDP; 2021)	2021 – BSP
	Loan-to-deposit ratio (Ratio (%); 2021)	2021 – BSP
Macro and Debt Service Forecast (in billions LCU; 2022-2027)	Interest expenditures on existing debt denominated in local currency	2022 – BESF 2023-2024 – Computed using FY2022 BESF MT Disbursement total interest payments 80/20 domestic/foreign according to BTr. 2025-2027 – Approximated at PhP350 billion
	Interest expenditures on existing debt denominated in foreign currency	2022 – BESF 2023-2024 – Computed using FY2022 BESF MT Disbursement total interest payments 80/20 domestic/foreign according to BTr. 2025-2027 – Approximated at PhP110 billion
	Principal payments on existing debt denominated in local currency	2022 – BESF 2023 approximated at PhP600 billion, 2024 at PhP500 billion, 2025 at PhP400 billion, 2026 and 2027 at PhP300 billion
	Principal payments on existing debt denominated in foreign currency	2022 – BESF 2023-2025 – Approximated at PhP150 billion 2026-2027 – Approximated at PhP125 billion
	New Issuance of Domestic Debt	Sum of new short-term and long-term domestic debt 2022 – Computed as financing needs less new external debt from BESF

Input	Variable	Data and Assumptions
Issuance of New Debt to Fill Fiscal Needs (in billions LCU; 2022-2027)		2023-2027 – 80% of financing needs to be filled with new issuance % share of each type of new debt based from 2022 new debt issuance
	Short-term debt denominated in local currency	2022-2027 – 23.36% of new domestic debt Semi-annual payments; grace period set to 1; maturity set to 1 Interest rate of debt issued in 2022-2027 is the max value among Treasury bills issued in 2021 (as of Sept. 2021).
	Long-term debt denominated in local currency	2022-2027 – Distribution for types 1 to 4 are 8.58%, 24.74%, 20.6%, and 24.72% of new domestic debt Annual payments; grace period set to 1 Type 1 – 3-year maturity; – Interest rate used is the max value of coupon rate among 3-year bonds issued in 2021 (as of Sept 30 2021) Type 2 – 5-year maturity; – Interest rate used is the max value of coupon rate among 5-year bonds issued 2021 Type 3 – 10-year maturity; includes 7-year bonds and AR bonds; – Interest rate used is the max value of coupon rate among 10-year and 7-year bonds issued 2021 Type 4 – 20-year maturity; includes 20-year and 25-year bonds; – Interest rate used is the max. value of coupon rate among 20-year and 25-year bonds issued 2021
	New Issuance of External Debt	Sum of new short-term and long-term external debt 2022 – BESF 2023-2027 – Assumed to be 20% of Financing needs to be filled with new issuance % share of each type of new debt based from 2022 new debt issuance
	Long-term debt denominated in foreign currency	2022 – BESF 2023-2027 – Assumed to be 100% of the computed new external debt Annual payments; Grace period set to 1 Type 16 – 10-year maturity; includes external debt maturing in 10 years or less – 2023-2026 assumed 0.05% of new external debt. Type 17 – 20-year maturity; includes external debt maturing in more than 10 years but less than or equal to 20 years – 2023-2026 assumed 14.03% of new external debt Type 18 – 25-year maturity; includes external debt maturing in more than 20 years but less than or equal to 25 years. – 2023-2026 assumed 59.77% of new external debt Type 19 – 30-year maturity; includes external debt maturing in more than 25 years. – 2023-2026 assumed 26.15% of new external debt Max. values of interest rates for each type of external debt were applied to 2021 and 2022. For 2023-2026, interest rates of 2022 were applied.
	Domestic Residual Financing (if any)	Assumed by the template as a short-term domestic debt; Zero interest rates applied

Appendix C. Shock scenario design

Shock Scenario	Shock Description
Historical scenario	Real GDP growth rate, real interest rate, and primary balance are set to historical averages.
Constant Primary balance	Constant primary balance as in the first year of projection in the baseline.
Primary balance Shock	Minimum shock equivalent to 50% of planned adjustment (50% implemented), or baseline minus half of the 10-year historical standard deviation, whichever is larger. There is an increase in interest rates of 25bps for every 1% GDP worsening in the primary balance.
Real GDP growth shock	Real GDP growth is reduced by 1 standard deviation for 2 consecutive years; revenue-to-GDP ratio remains the same as in the baseline; level of non-interest expenditures is the same as in the baseline; deterioration in primary balance leads to higher interest rate (see above); decline in growth leads to lower inflation (0.25 percentage points per 1 percentage point decrease in GDP growth).
Interest rate shock	Interest rate increases by difference between average real interest rate level over projection and maximum real historical level, or by 200bp, whichever is larger.
Real exchange rate shock	Estimate of overvaluation or maximum historical movement of the exchange rate, whichever is higher; pass-through to inflation with default elasticity of 0.25 for EMs and 0.03 for AEs.
Combined macro-fiscal shock	Shock size and duration based on the underlying shocks.
Financial sector contingent liability shock	One-time increase in non-interest expenditures equivalent to 10% of banking sector assets leads to a real GDP growth shock (see above): growth is reduced by 1 standard deviation for 2 consecutive years; revenue-to-GDP ratio remains the same as in the baseline; deterioration in primary balance leads to higher interest rate; decline in growth leads to lower inflation.

Source: IMF (2014)

Appendix D. Economic indicators and contribution to changes in public debt

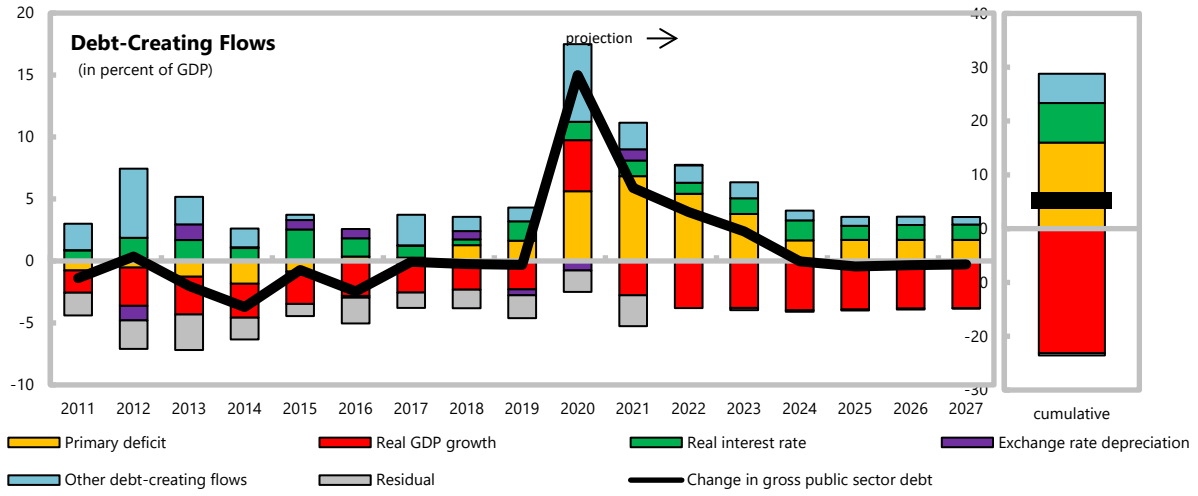
In percent of GDP

Debt, Economic and Market Indicators

	Actual			Projections						As of January 01, 2022		
	2011-2019	2020	2021	2022	2023	2024	2025	2026	2027	Sovereign Spreads		
Nominal gross public debt	43.5	54.6	60.5	64.4	66.8	66.8	66.4	66.0	65.7	Bond Spread (bp)		276
Public gross financing needs	5.3	10.9	13.5	11.5	12.1	9.7	8.8	8.1	9.4	5Y CDS (bp)		258
Public debt (in percent of potential GDP)												
Real GDP growth (in percent)	6.3	-9.6	5.5	6.9	6.4	6.5	6.4	6.3	6.3	Ratings	Foreign	Local
Inflation (GDP deflator, in percent)	2.0	1.6	2.8	2.6	2.5	2.5	2.5	2.5	2.5	Moody's	Baa2	Baa2
Nominal GDP growth (in percent)	8.5	-8.1	8.1	10.0	9.1	9.2	9.0	8.9	9.0	S&Ps	BBB+	BBB+
Effective interest rate (in percent)	5.5	4.9	5.4	4.4	4.8	5.3	4.5	4.6	4.7	Fitch	BBB	BBB

Contribution to Changes in Public Debt

	Actual			Projections							
	2011-2019	2020	2021	2022	2023	2024	2025	2026	2027	cumulative	Debt-stabilizing primary balance
Change in gross public sector debt	-1.2	15.0	5.9	3.9	2.4	0.0	-0.4	-0.3	-0.3	5.2	
Identified debt-creating flows	0.6	16.7	8.4	3.9	2.6	0.1	-0.4	-0.3	-0.3	5.7	
Primary deficit	-0.2	5.6	6.8	5.4	3.8	1.7	1.7	1.7	1.7	19.6	-2.0
Primary (noninterest) revenue and grants	14.6	15.8	14.9	15.4	15.4	15.9	15.9	15.9	15.9	90.8	
Primary (noninterest) expenditure	14.4	21.4	21.7	20.8	19.2	17.6	17.6	17.6	17.6	110.4	
Automatic debt dynamics	-1.0	4.8	-0.6	-2.9	-2.5	-2.4	-2.8	-2.6	-2.6	-15.8	
Interest rate/growth differential	-1.2	5.6	-1.5	-2.9	-2.5	-2.4	-2.8	-2.6	-2.6	-15.8	
Of which: real interest rate	1.4	1.5	1.3	0.9	1.3	1.6	1.1	1.2	1.2	7.4	
Of which: real GDP growth	-2.6	4.1	-2.8	-3.8	-3.8	-4.0	-3.9	-3.8	-3.8	-23.1	
Exchange rate depreciation	0.2	-0.8	0.9	…	…	…	…	…	…	…	
Other identified debt-creating flows	1.8	6.3	2.2	1.4	1.3	0.8	0.7	0.7	0.6	5.5	
Please specify (e.g., privatization receipts)	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Please specify (e.g., other debt flows)	1.9	6.3	2.2	1.4	1.3	0.8	0.7	0.7	0.6	5.5	
Residual	-1.8	-1.7	-2.5	-0.0	-0.2	-0.1	-0.1	-0.1	-0.0	-0.4	

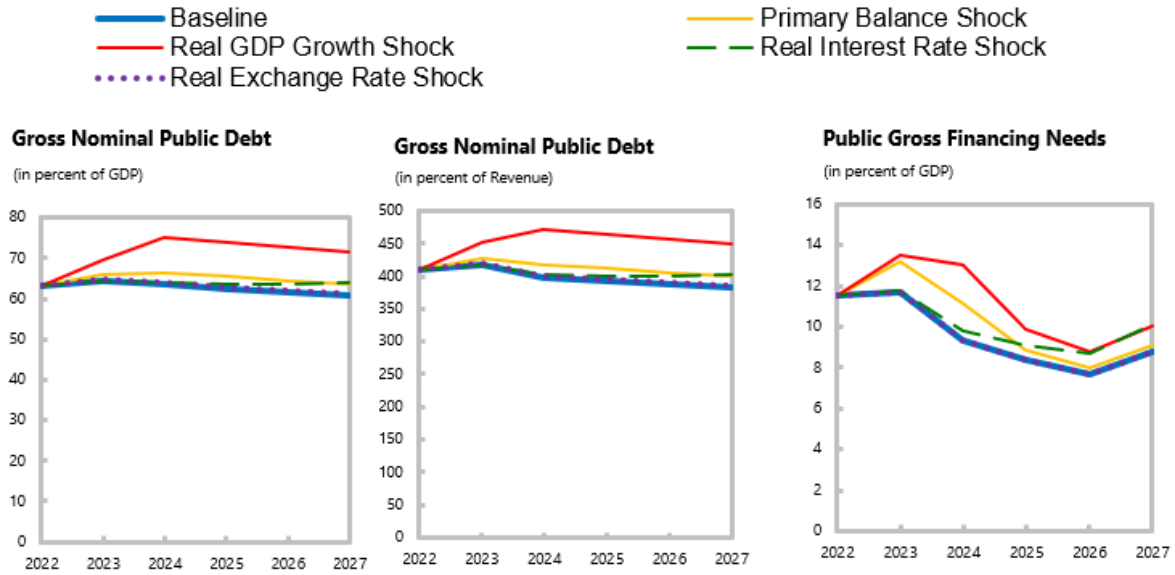


Appendix E. Debt sustainability analysis and risk scenarios with the exclusion of budgetary change in cash

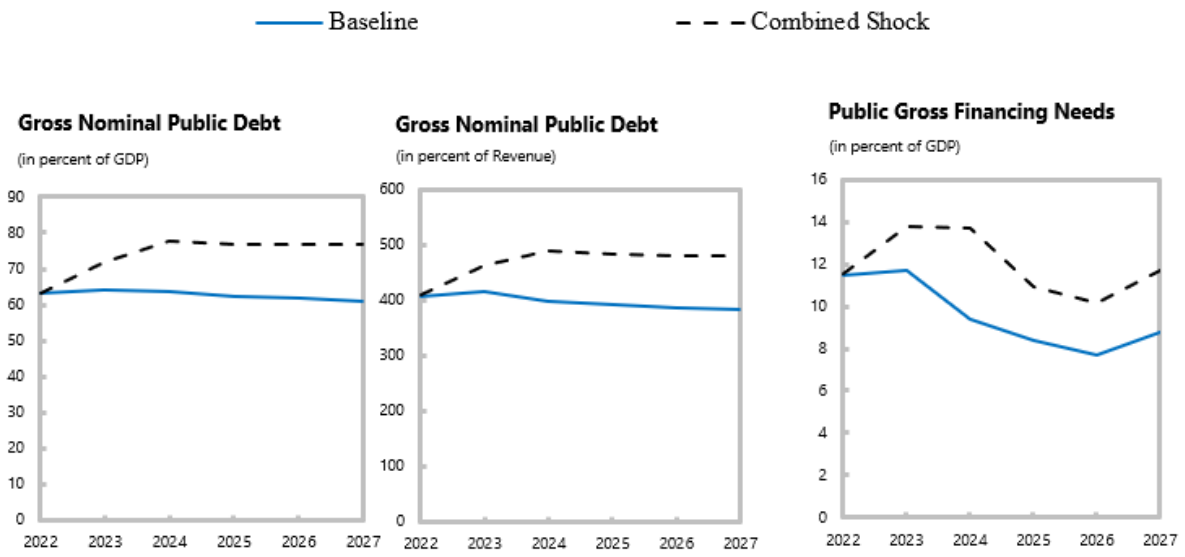
E.1. Debt-to-GDP ratio projections per percentile, 2017-2027

Percentile	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
0.00	0.40	0.40	0.40	0.55	0.60	0.50	0.42	0.37	0.34	0.32	0.26
0.05	0.40	0.40	0.40	0.55	0.60	0.55	0.53	0.50	0.47	0.46	0.42
0.10	0.40	0.40	0.40	0.55	0.60	0.57	0.56	0.53	0.50	0.48	0.47
0.25	0.40	0.40	0.40	0.55	0.60	0.60	0.59	0.57	0.56	0.55	0.53
0.50	0.40	0.40	0.40	0.55	0.60	0.63	0.64	0.64	0.62	0.62	0.61
0.75	0.40	0.40	0.40	0.55	0.60	0.67	0.69	0.69	0.70	0.69	0.69
0.90	0.40	0.40	0.40	0.55	0.60	0.70	0.74	0.75	0.75	0.76	0.77
0.95	0.40	0.40	0.40	0.55	0.60	0.72	0.76	0.79	0.80	0.81	0.82
1.00	0.40	0.40	0.40	0.55	0.60	0.85	0.91	0.95	1.04	0.99	1.00

E.2. Macro-fiscal stress tests, 2022-2027



E.3. Additional stress tests, 2022-2027



E.4. Economic indicators and contribution to changes in public debt excluding budgetary change in cash (baseline scenario)

Debt, Economic and Market Indicators

	Actual			Projections					
	2011-2019	2020	2021	2022	2023	2024	2025	2026	2027
Nominal gross public debt	43.5	54.6	60.5	63.0	64.2	63.5	62.5	61.7	61.0
Public gross financing needs	5.3	10.9	13.5	11.5	11.7	9.4	8.4	7.7	8.8
Public debt (in percent of potential GDP)									
Real GDP growth (in percent)	6.3	-9.6	5.5	6.9	6.4	6.5	6.4	6.3	6.3
Inflation (GDP deflator, in percent)	2.0	1.6	2.8	2.6	2.5	2.5	2.5	2.5	2.5
Nominal GDP growth (in percent)	8.5	-8.1	8.1	10.0	9.1	9.2	9.0	8.9	9.0
Effective interest rate (in percent)	5.5	4.9	5.4	4.4	4.8	5.3	4.5	4.6	4.7

As of January 01, 2022		
Sovereign Spreads		
Bond Spread (bp)		276
5Y CDS (bp)		258
Ratings	Foreign	Local
Moody's	Baa2	Baa2
S&Ps	BBB+	BBB+
Fitch	BBB	BBB

Contribution to Changes in Public Debt

	Actual			Projections							
	2011-2019	2020	2021	2022	2023	2024	2025	2026	2027	cumulative	Debt-stabilizing primary balance
Change in gross public sector debt	-1.2	15.0	5.9	2.5	1.2	-0.7	-1.0	-0.8	-0.7	0.5	
Identified debt-creating flows	-1.2	10.5	6.2	2.5	1.3	-0.6	-0.9	-0.8	-0.7	0.9	
Primary deficit	-0.2	5.6	6.8	5.4	3.8	1.7	1.7	1.7	1.7	16.0	-2.4
Primary (noninterest) revenue and grants	14.6	15.8	14.9	15.4	15.4	15.9	15.9	15.9	15.9	94.4	
Primary (noninterest) expenditure	14.4	21.4	21.7	20.8	19.2	17.6	17.6	17.6	17.6	110.4	
Automatic debt dynamics	-1.0	4.8	-0.6	-2.9	-2.4	-2.2	-2.6	-2.5	-2.4	-15.1	
Interest rate/growth differential	-1.2	5.6	-1.5	-2.9	-2.4	-2.2	-2.6	-2.5	-2.4	-15.1	
Of which: real interest rate	1.4	1.5	1.3	0.9	1.3	1.6	1.1	1.1	1.2	7.1	
Of which: real GDP growth	-2.6	4.1	-2.8	-3.8	-3.7	-3.8	-3.7	-3.6	-3.6	-22.2	
Exchange rate depreciation	0.2	-0.8	0.9	…	…	…	…	…	…	…	
Other identified debt-creating flows	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Please specify (e.g., privatization receipts)	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Please specify (e.g., other debt flows)	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0
Residual	0.1	4.5	-0.3	0.0	-0.2	-0.1	-0.1	-0.1	0.0	-0.4