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## Sovereign debt vulnerabilities in Asia and the Pacific

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# SOVEREIGN DEBT VULNERABILITIES IN ASIA AND THE PACIFIC

*Benno Ferrarini, Suzette Dagli, and Paul Mariano*

**NO. 680**

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## Sovereign Debt Vulnerabilities in Asia and the Pacific

Benno Ferrarini, Suzette Dagle, and Paul Mariano

No. 680 | April 2023

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## ABSTRACT

Three major global crises since 2008 have pushed up public and external debt ratios and associated risks across much of Asia and the Pacific. This is confirmed by debt ratio projections and evidence of widening pockets of vulnerability picked up by regional heat maps in this paper. By and large, the outlook is not yet suggestive of a widespread debt crisis looming in the region, and risks continue to be highest for economies that have long been struggling with unsustainably high debt because of structural and other challenges that well precede the recent pandemic and other crises. However, even for economies with a seemingly benign outlook, it is increasingly difficult to envisage just how more widespread fiscal pressure and debt distress could be averted indefinitely. A most challenging global environment is hampering growth while raising the cost of borrowing and need for fiscal spending. The premise for restoring public finances and ensuring their sustainability after the pandemic crisis was for exactly opposite conditions to prevail.

**Keywords:** sovereign debt sustainability, public debt, external debt, debt heat map

**JEL codes:** H63, H68

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## I. RISING DEBT AMID THREE GLOBAL CRISES

Average public debt among Asian Development Bank's (ADB's) developing members<sup>1</sup>—henceforth referred to collectively as “Developing Asia” or “Asia and the Pacific”—spiked with the Asian Financial Crisis of the late 1990s and trended down during much of the 2000s. Debt turned around and started rising again with the 2008–2009 global financial crisis, as quantitative easing and fiscal intervention in the United States (US), Europe, and other affected countries generated a massive wave of financial capital in search of high yields. Governments in Asia and the Pacific welcomed such borrowing opportunities at low cost, having strengthened macroprudential regulation in their domestic markets and with sounder external balances compared to the 1990s. By 2019, government debt<sup>2</sup> had grown to average 43% of gross domestic product (GDP), up 10 percentage points (pp) since 2008.

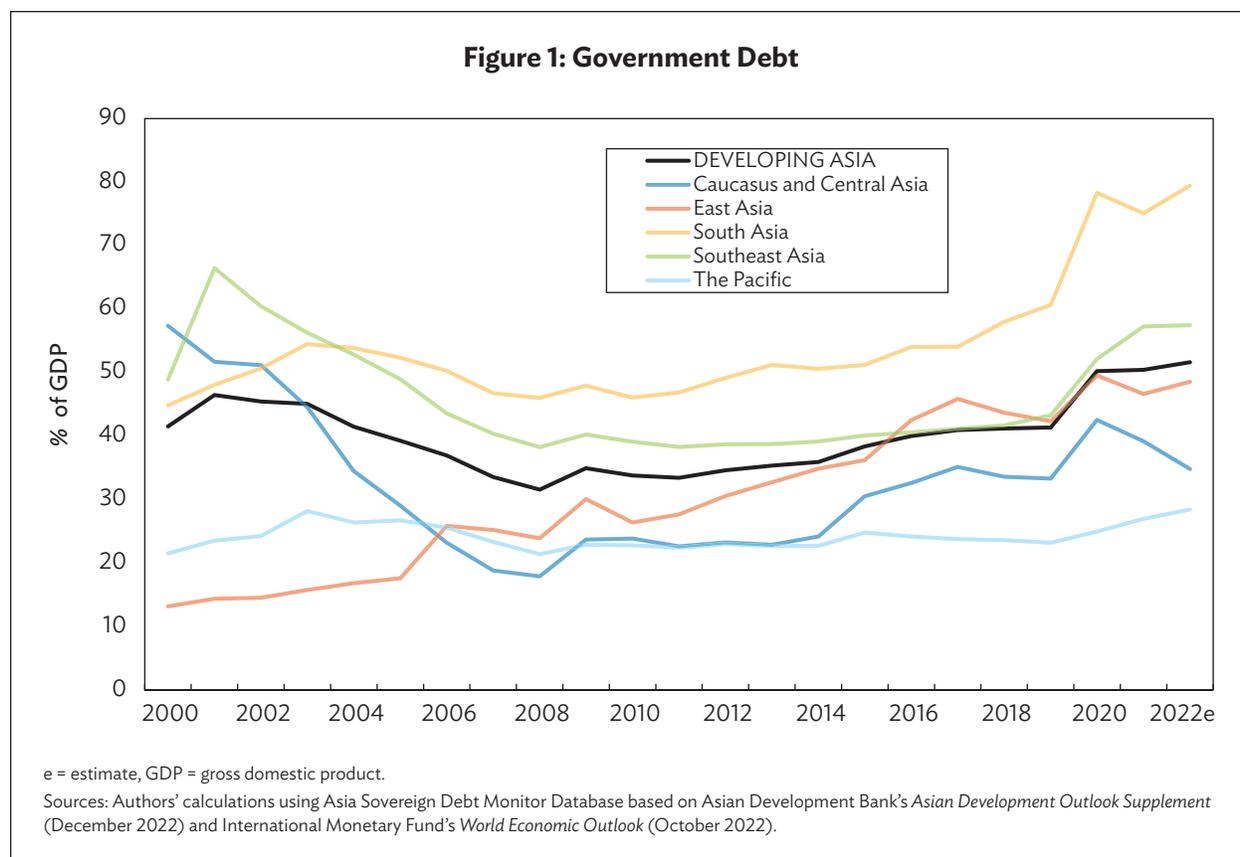
Subregional averages reveal a picture of considerable variation across developing Asia (**Figure 1**). Debt ratios are highest and rising the most in South Asia, while they are relatively low and more stable in the Pacific. Debt grew especially fast and large where governments had the necessary fiscal space and domestic or foreign capital market access to borrow and counter the vast economic fallout from the slump in international trade and investment that had ensued from the crisis propagating out of Wall Street first, and afflicting the European and global financial markets later. In few economies, especially the People's Republic of China (PRC), corporate and household leverage expanded much faster than the governments', causing total debt ratios to reach levels previously unseen in Asia outside Japan and the financial centers of Singapore and Hong Kong, China. Even the lower-middle income countries increasingly resorted to commercial borrowing to the extent available, alongside multilateral and bilateral official loans, increasingly so from the PRC, and to a lesser extent from India and a few other such emerging lenders.

The coronavirus disease (COVID-19) pandemic and its massive economic repercussions from early 2020 onward came at a time when public debt levels had already been on the rise and signs of heightened vulnerabilities and dwindling fiscal space had started showing. Yet governments facing an unprecedented public health crisis had little choice, but to massively borrow and scale-up their emergency and recovery spending to protect lives and livelihoods, as well as propping up the viability of firms and entire economic sectors. Fiscal deficits and sovereign debt ratios soared as a result; by 2021, government debt ratios in Asia and the Pacific averaged 51%, up 8 pp from only 2 years prior and nearly as much as ratios had risen during the decade before. Again, the PRC and other economies with the most access to financial markets—especially domestic loans and securities, but also externally—were able to enact the largest fiscal and monetary packages in response to this truly global crisis. Those poorer and with limited access to the international capital markets spent far less for their people, firms, and economies, as they had to make do within the limits of official development assistance and grant financing. While crisis impacts and circumstances vary across the region, all economies suffered a great deal and virtually none came out of the crisis unscathed.

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<sup>1</sup> ADB counts 46 developing members in Asia and the Pacific. Throughout this paper, averages refer to economies with data available and in some of the discussion, they deliberately exclude Singapore and Hong Kong, China. Not only are these financial centers' debt ratios mere distortions in the context of computing regional averages, they are also largely irrelevant to the assessment of public debt in the region: while public debt as a percentage of GDP is negligibly low for Hong Kong, China, this ratio is exceedingly high for Singapore, where the financial authority issues bonds to establish a yield curve that could guide the financial markets, but not to finance the government's fiscal budget, so that the government debt ratio is largely unrepresentative of a liability as such.

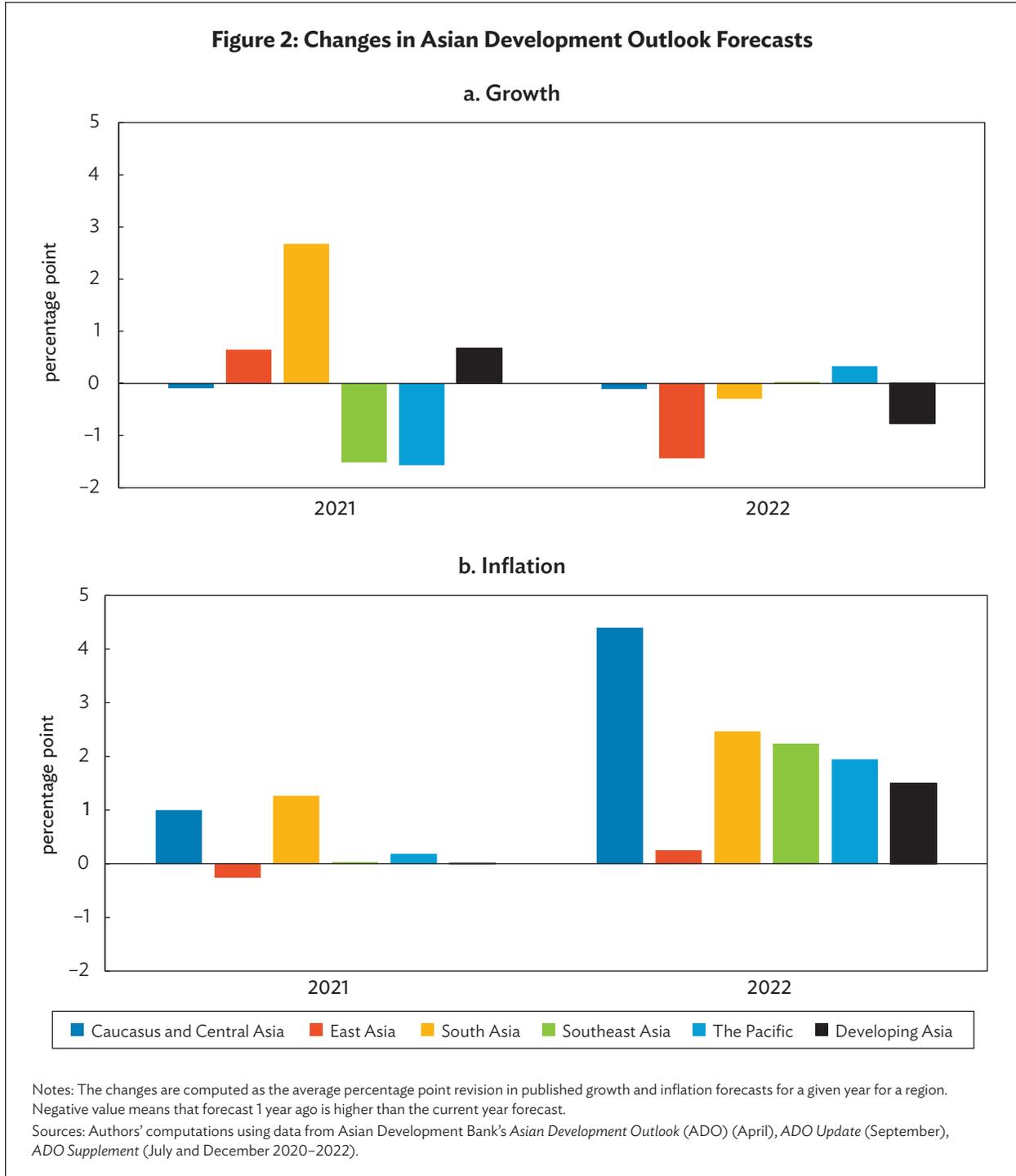
<sup>2</sup> For ease of discussion, we use the terms “public debt” and “government debt” interchangeably throughout the paper, although the former is typically used to denote a broader category of public sector liabilities. The majority of developing countries in the region report just “central government debt,” others with large subnational entities report also a government's aggregate liability, as “general government debt.”



While the pandemic and the policy-imposed lockdown of entire economies dragged on, the spreading of immunization from vaccines and the gradual lifting of travel restrictions and reopening of international borders did eventually usher in a rebound in economic growth, averaging 7% in 2021 for Asia and the Pacific. That rebound was reflective mostly of continuing government deficit spending or out of sheer base effects from previous year's slump, and there was emerging evidence of widespread scarring, keeping economies from bouncing back fully to their previous path performance. Nevertheless, fiscal pressures from deep primary deficits and heightened debt ratios were being kept in check by exceptionally liquid, favorable, and seemingly enduring global financial conditions brought about by more than a decade of ultra-loose monetary and fiscal policy in the global financial centers. These were keeping interests at an all-time low and investors eager to reap the higher yields offered by the emerging and frontier economies, especially so in high-growth Asia.

But these circumstances took a sudden and unexpected turn with the Russian invasion of Ukraine in February 2022, triggering yet another crisis to rock the global economy, the third in little over a decade. Energy and food prices went soaring, and interest rates and risk premiums shot up as the US Federal Reserve and other central banks sharply tightened monetary policy to stem rampant inflation. The US and several European economies have since slipped into or are close to recession, and growth has slowed much elsewhere, while inflation remains largely untamed. Forecasters have been rushed to revise downward their growth outlooks, also for Asia and the Pacific, including the PRC, and safe for major energy exporters and few other economies. For example, ADB's *Asian Development Outlook* (ADO) lowered its 2022 growth forecasts for all subregions, but Southeast Asia and the Pacific—and most notably for East Asia on account of slowing growth in the PRC—while inflation forecasts shot

up significantly across the region (**Figure 2**). Even so, the latest forecasts in ADB’s *ADO Supplement* (December 2022) and International Monetary Fund’s (IMF’s) *World Economic Outlook* (WEO October 2022) are predominantly of rebounding growth and a gradual fiscal normalization across Asia and the Pacific.



## II. PUBLIC DEBT BASELINE PROJECTIONS FOR ASIA AND THE PACIFIC

ADB's Asia Sovereign Debt Monitor (ASDM) implements debt dynamics computations that translate the IMF's and ADB's largely benign macroeconomic forecasts into roughly stable debt ratio projections across much of the region over the medium term (**Box 1**). Limiting focus on a medium-term horizon through to 2025—given the extraordinary uncertainty surrounding forecast assumptions<sup>3</sup>—the (unweighted) average baseline public debt ratio for the region (in blue) is seen stabilizing at about 51% of GDP since its upward hike in 2020 by effect of the pandemic shock (**Figure 3a**). An analysis of the drivers of variation in debt reveals that strangled economies and large fiscal deficits pushed debt ratios up during the height of the pandemic (2020–2021), while strong growth and moderate fiscal balances had kept ratios in check in the years leading up to it (2018–2019) (**Figure 3b**). Rebounding growth, although weakened by the global economic implications of Russian invasion of Ukraine, is now expected to counterbalance persisting primary deficits throughout (2022–2025), keeping debt ratios stable across developing Asia, on average.

For sure, these are but regional averages, and there are economies that have been faring much worse—most notably Sri Lanka, now in deep crisis and default. While not in outright default, the Lao People's Democratic Republic (Lao PDR), Pakistan, and few other countries in the region have been facing major challenges to refinancing their debts and maintaining sustainability amid mounting interest rates and pressure on their currencies. There are also countries whose public debt ratio is expected not to stabilize, but to increase steadily—for example, the PRC's, because of high fiscal deficits expected throughout the medium term, and having faced headwinds from repeated lockdowns and later the COVID-19 pandemic spreading among

### Box 1: The Asia Sovereign Debt Monitor

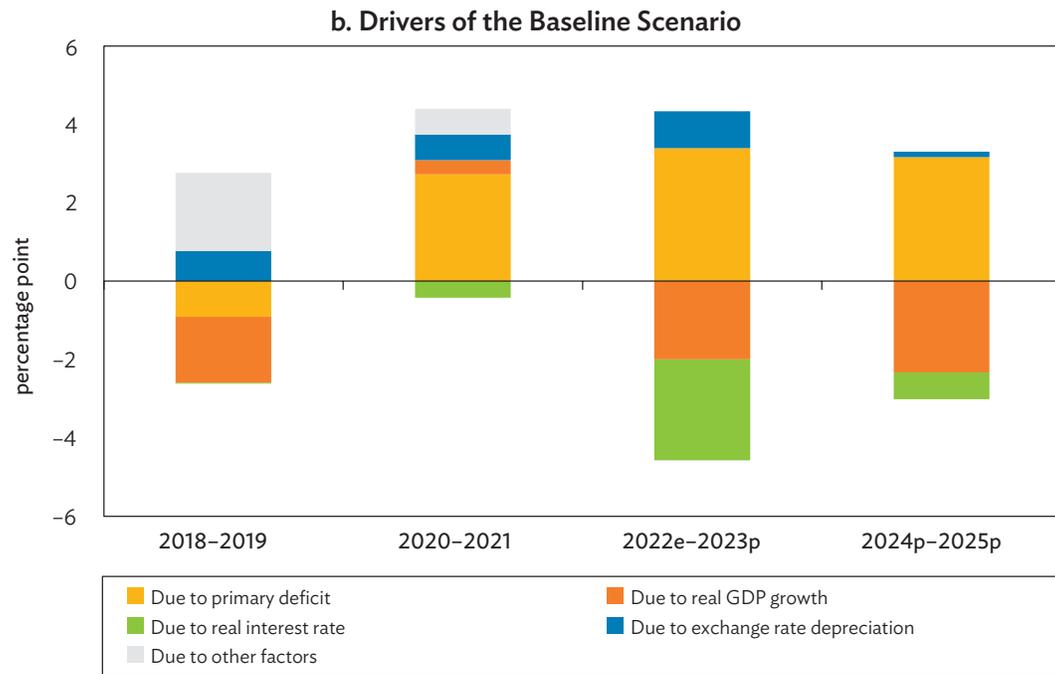
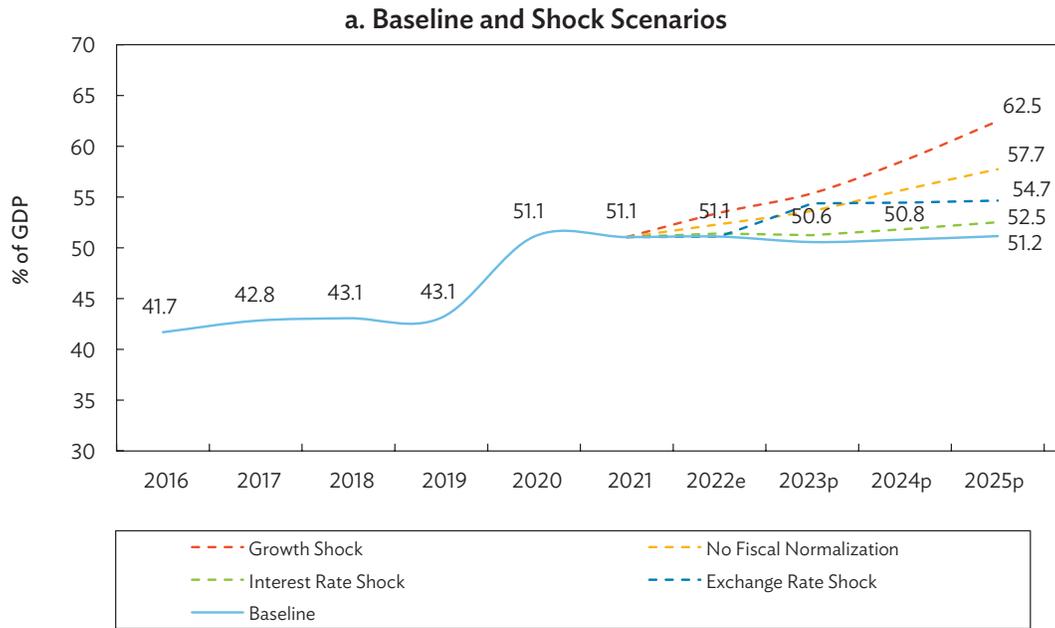
The Asia Sovereign Debt Monitor (ASDM) was set up in 2020 in the context of Asian Development Bank's (ADB's) technical assistance (TA) in debt analytics and debt management to developing members under the purview of TA projects No. 9841 and No. 6913. It combines debt dynamics akin to the International Monetary Fund (IMF) Debt Dynamics Tool and financial programming elements for an analytical platform that is suitable to assessing the drivers of public and external debt and to producing baseline projections and customized scenario analysis. In the context of training and analytical support provided to staff of public debt management offices, the ASDM serves as a basic platform for projections among a broader array of tools deployed, and the data and assumptions used in that context are treated as confidential.

The ASDM is also being maintained by the TA team of researchers for medium-term public and external debt projections of ADB's 46 developing members, for the purpose of internal monitoring. To do this, the ASDM sources exclusively from the public domain for a total of about 1,300 fiscal and macroeconomic variables for each economy from 1990 onward, drawing on IMF and World Bank Group databases and a multitude of other repositories and reports such as International Debt Report, Fiscal Space Database, Government Finance Statistics, IMF Article IV Staff Reports, CEIC, Haver as well as publicly available national data sources. The debt dynamics computations in ASDM are made to reflect the latest macroeconomic and fiscal forecasts by the IMF's World Economic Outlook (WEO) and the ADB's Asian Development Outlook (ADO). Accordingly, the ASDM gets updated upon these reports' periodic release and update, every April, July, October, and December.

Sources: Authors, ADB. 2019. *Technical Assistance for Debt Analytics and Technical Capacity Building*. Manila; ADB. 2022. *Technical Assistance for Sovereign Debt Analytics and Management Support*. Manila.

<sup>3</sup> For an assessment of ADO and WEO GDP and inflation forecast accuracy, see Ferrarini (2019), and for a review of IMF budget projections, see Panizza (2022).

**Figure 3: Public Debt Ratios in Developing Asia**



e = estimate, GDP = gross domestic product, p = projection.

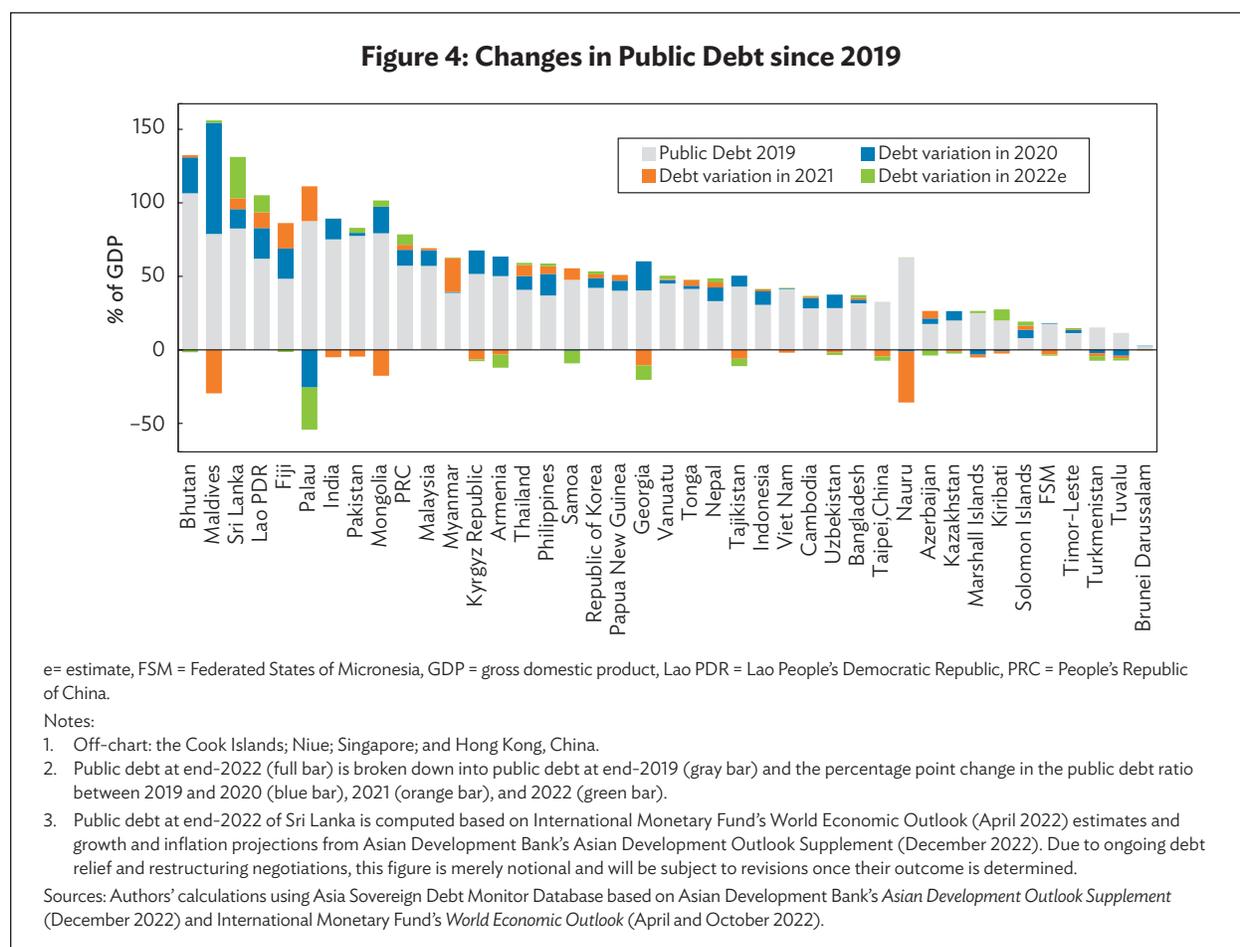
Notes:

- Off-chart: Niue; the Cook Islands; Singapore; and Hong Kong, China.
- Regional averages are computed as simple average of individual economies' ratios.
- Prolonged Slowdown in Economic Growth Scenario: Economic growth rates in 2022-2025 are half those assumed by the baseline scenario.
- No Fiscal Normalization Scenario: Assumes that the fiscal deficit-to-GDP is equivalent to average 2020-2022 baseline level through to 2025.
- Interest Rate Shock Scenario: Assumes a doubling of effective interest rate on new and rollover (25% of debt stock) debt per year.
- Exchange Rate Shock Scenario: Assumes that depreciation of the nominal exchange rate in 2023 is equivalent to the largest depreciation since 2013.
- "Due to other factors" comprises other net debt-creating flows and residuals in the debt dynamics computation. Residual factors can include cross exchange rate valuation effects, intra-period valuation effect, and other accounting issues that affect the value of the stock of debt.

Sources: Authors' calculations using Asia Sovereign Debt Monitor Database based on Asian Development Bank's *Asian Development Outlook Supplement* (December 2022) and International Monetary Fund's *World Economic Outlook* (October 2022).

the population and affecting regional centers and supply chains that are crucial to this economy's industrial production, services, and trade. Cross-regional heterogeneity and successive downgrades notwithstanding, ADO and WEO medium- and long-term forecasts have remained broadly optimistic so far, confiding in the region's fundamental strengths deriving from mostly solid economic growth prospects, broad reliance on domestic bond markets that have been growing broader and deeper especially among the emerging economies, and from significant progress in debt management capacity over the past 2 decades or so.

Some countries' debt has soared more markedly and well above the regional average, especially among those with a legacy of high debt. South Asia stands out—Sri Lanka<sup>4</sup> (49 pp), Maldives (48 pp), and Bhutan (24 pp) all recorded especially large increases from high levels of debt well before the pandemic. Several other countries saw debt ratios grow by more than 20 pp: the Lao PDR (43 pp), Fiji (36 pp), and the Philippines (22 pp). Somewhat lesser spikes are observed in highly indebted India (9 pp) and Mongolia (5 pp) and, from more moderate levels to start with, in Thailand (18 pp), Malaysia (12 pp), Indonesia (11 pp), Papua New Guinea (11 pp), and the Kyrgyz Republic (8 pp). In the PRC, government debt increased to over 78% of GDP in 2022, way up from 57% in 2019, but short still of its massive and rising levels of nonfinancial corporate debt, now at 157% of GDP. Except for some outliers—especially in the Pacific where debt ratios tend to swing erratically and often in reflection of large single amortization payments or similar one-off transactions—debt has shot up markedly across much of the region as a result of the pandemic economic crisis (**Figure 4**).



<sup>4</sup> Here and throughout the paper, Sri Lanka's debt ratio from 2022 onwards is meant to be merely notional and constitutes not an estimate or forecast as such, as the country has been undergoing debt relief negotiations the outcome of which, once determined, will affect its sovereign debt schedule, stock outstanding, and debt sustainability assessment more broadly.

### III. RISKS AND SCENARIO ANALYSIS—SLOWER GROWTH AND RISING INTEREST RATES

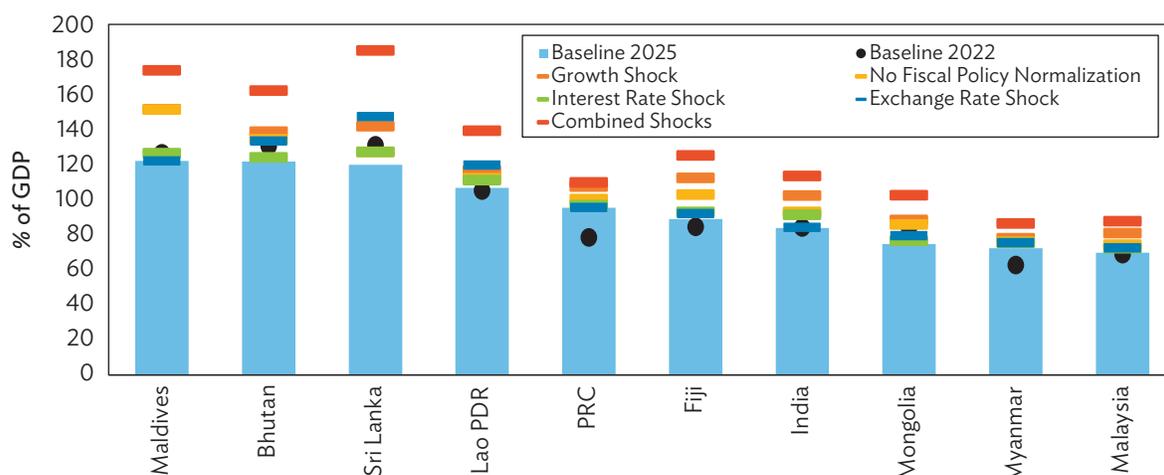
The main risks to these forecasts are that disappointing economic growth and renewed needs for fiscal support to populations and economies suffering the adverse impacts of rising inflation and high and volatile commodity prices will cause budget deficits to deepen again and debt ratios increase further where there is some fiscal space available, or painful spending reprioritization where there is none. At the same time, rising interest rates and foreign exchange rate developments against a soaring US dollar are adding pressure on both fiscal and external accounts that are already stretched by a sluggish rebound in fiscal and foreign trade revenues, especially from the tourism sector.

Taking a simplified view about the future, scenario analysis of lower growth (by half), sticky fiscal deficits (staying at their pandemic level, 2020–2022), higher interest rates (twice as high and assuming a 25% passthrough per year as debt gets rolled over), or exchange rate depreciation (equivalent to the largest rate of depreciation experienced since 2013) against baseline assumptions suggests that each such major shock would further raise and destabilize debt ratios in the region (**Figure 3**). A lack of fiscal normalization would take debt ratios close to 58% of GDP by 2025 on average, or nearly 7 pp above the baseline. Slower growth would lift debt ratios even higher, to average 63% of GDP. Higher interest rates would have a somewhat lesser effect, albeit substantial, because it takes time for heightened rates to affect a country's fixed-rate debt outstanding as it gradually falls due and gets rolled over.<sup>5</sup> Any repeat exchange rate depreciation to the degree experienced by countries historically, including recently, can be seen lifting the average debt ratio significantly.

Economies most reliant on high growth to stabilize the debt ratio would experience it rise the most in the case of a significant slowdown. For instance, if growth in Maldives failed to bounce back to average 7.3% in 2022–2025 and turned out to realize only half that pace, the debt-to-GDP ratio would project to 152% by 2025 (**Figure 5**). By the same token, countries that run deep fiscal deficits to stem the fallout from the pandemic are the most prone to deteriorating debt ratios if their fiscal policy failed to normalize in the years to come. For example, Fiji's failure to move back to its medium-term fiscal performance before the pandemic would drive debt to over 100% of GDP by 2025. A doubling of interest rates would affect borrowing costs especially in countries such as India, where rates are high already and interest payments consumed nearly 30% of fiscal revenues in 2021. Rates rising to twice their current size would not only imply a tremendous fiscal burden from India's debt stock as is, but also raise it further as borrowing needs would increase as a result. Finally, if the Lao PDR's exchange rate depreciated by 44% in 2023, just like it did the year before, this alone would cause its government debt to inflate to an unsustainable 120% of GDP by 2025.

A combination of these four shocks would see debt ratios balloon for a whole range of countries. This would be akin to a significant reduction of the interest-growth differential, or even a sign inversion for some countries. Against the backdrop of worsening primary fiscal deficits, such a confluence of negative shocks would raise debt ratios significantly and could eventually cause a loss of control over debt dynamics in the region (**Figure 5**).

<sup>5</sup> In this regard, it is important to bear in mind that static projections merely affect individual drivers of debt, but shed no light on the dynamic aspects of debt sustainability and distress. For example, in a stochastic setting, the interest rate schedule is not simply a function of the risk-free rate, but rather is endogenous to debt approaching its limit, whatever lenders perceive it to be. Seeing or perceiving that limit approach, a spiking risk premium would send borrowing costs soaring and push the situation beyond sustainability. This is to say that matters are not as straightforward and linear as they may appear in simplistic debt ratio projections, and that disruptions are lingering also along the lower segments of the debt ratio distribution.

**Figure 5: Government Debt—Baseline and Shock Scenarios**

GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

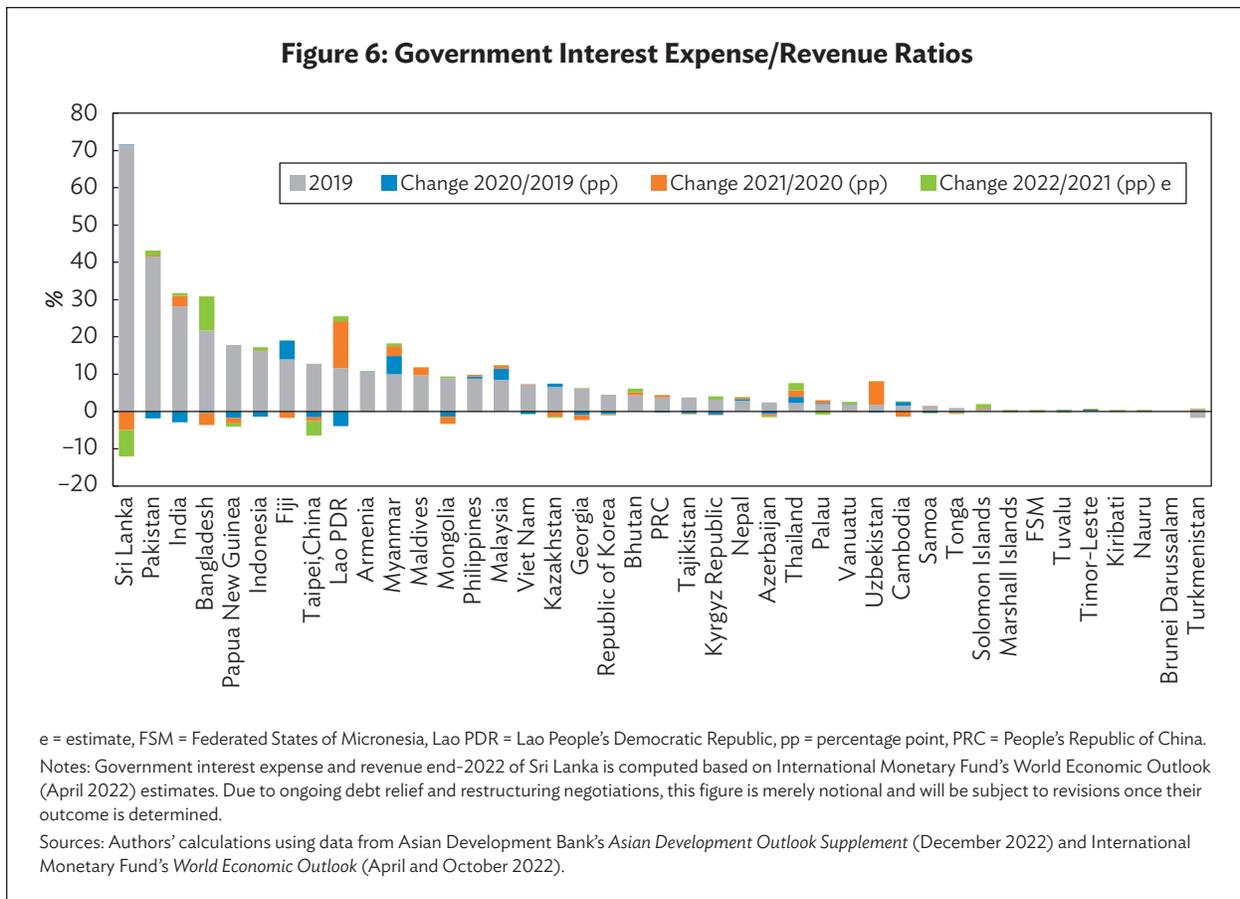
Notes:

- Shows economies with the highest level of baseline public debt (% of GDP) by 2025.
- Prolonged Slowdown in Economic Growth Scenario: Economic growth rates in 2022–2025 are half those assumed by the baseline scenario.
- No Fiscal Normalization Scenario: Assumes that the fiscal deficit-to-GDP is equivalent to average 2020–2022 baseline level through to 2025.
- Interest Rate Shock Scenario: Assumes a doubling of effective interest rate on new and rollover (25% of debt stock) debt per year.
- Exchange Rate Shock Scenario: Assumes that depreciation of the nominal exchange rate in 2023 is equivalent to the largest depreciation since 2013.
- Projected public debt 2022 and 2025 in the baseline scenario are built upon macroeconomic and fiscal forecasts from the International Monetary Fund (IMF) *World Economic Outlook* (October 2022) and the Asian Development Bank (ADB) *Asian Development Outlook Supplement* (December 2022).
- Public debt baseline figures for 2022 and 2025 of Sri Lanka are computed based on International Monetary Fund's *World Economic Outlook* (April 2022) estimates and growth and inflation projections from Asian Development Bank's *Asian Development Outlook Supplement* (December 2022) and International Monetary Fund's *World Economic Outlook* (October 2022). Due to ongoing debt relief and restructuring negotiations, this figure is merely notional and will be subject to revisions once their outcome is determined.

Sources: Authors' projections using Asia Sovereign Debt Monitor Database based on ADB *Asian Development Outlook Supplement* (December 2022) and IMF *World Economic Outlook* (April and October 2022).

In a marked departure from the low-interest rate environment that was prevalent until recently and was keeping borrowing costs and default rates low despite a marked buildup of debt outstanding, growing interest rates are now raising the fiscal burden of borrowing, whether to cover for budget deficits or to roll over extant debt (**Figure 6**). This bites, as governments' vital fiscal resources are being squeezed against growing spending needs and with fiscal space already shrunk or exhausted after the pandemic. Generally, should economic growth in the region not return to its rapid long-term path, it is difficult to see just how post-pandemic reconstruction could be funded and how these new headwinds could be tackled. Without a substantially negative interest-growth differential keeping debt ratios in check, primary deficits would have to contract or turn to surpluses at a time when ailing economies and populations with an eroding purchasing power will be needing more targeted fiscal spending, not less. Failing that, the picture would be one of deteriorating primary balances, against the backdrop of economies that fail to generate the growth necessary to sustain both deficits and rising interest rates—an unsustainable move up and to the left in terms of **Figure 7**.

Risks, such as of sudden stops and (ongoing) capital flow reversals, are compounded in countries with a substantial share of debt denominated in foreign currency, which are usually owed mostly to foreign holders (**Figure 8**). Exchange rates against the US dollar have weakened in much of the region since early 2021 (**Figure 9**), and where international reserve holdings are inadequate, any major crunch in foreign exchange earnings such as from further restrictions to tourism flows, slowdown of key export markets, or an inflationary spike of import prices, could prove fatal to countries' external balances. Economies'



exposure to such risks appears prominently when considering their leverage in terms of total external debt, including both sovereign and private (**Figure 10**). Highly leveraged economies' external financing needs tend to be very substantial and often well in excess of a small or shrinking pool of international reserves as a backstop before a liquidity crunch either calls for painful current account adjustment or investor confidence may erode and access to finance dry up (**Figures 11 and 12**). Current challenges associated with closing external financing gaps in four of the region's most indebted economies are further analyzed in a section below.

Scenario analysis confirms countries' susceptibility to further exposure to external shocks, especially among those where debt ratios are highest already (**Figure 13**). Assuming shocks to either the exchange rates, current account balance, or investment net outflows commensurate to those experienced in the 4 years prior to 2023, a repeat of any such event would see external debt ratios spike to levels beyond any reasonable degree of sustainability. For example, a 15% depreciation of Mongolia's exchange rate, as happened in 2022, would lift its external debt ratio to 170% of GDP. A current account deficit equal to 4.7% of Mongolia's GDP, as in 2020, would raise its debt ratio even more, to 182% of GDP. Furthermore, if Malaysia experiences net investment outflows equivalent to 31% of GDP, as in 2019, its debt ratio would rise to 94%. And so on. The point is that while we are unable to pinpoint the exact threshold where a country's external debt ratio ceases to be sustainable and default becomes inevitable, it appears unlikely that ailing public finances and stretched external balances could survive any shocks commensurate to those experienced in the past few years of exceptional upheaval.

While private leverage is but a contingent liability in the context of public finances, Asian central governments are—by law or by necessity—liable for a substantial share of the leverage of financial

Figure 7: Baseline and Combined Shock Scenarios, 2025



ARM = Armenia; BAN = Bangladesh; BHU = Bhutan; CAM = Cambodia; COO = Cook Islands; FIJ = Fiji; FSM = Federated States of Micronesia; GEO = Georgia; GDP = gross domestic product; IND = India; INO = Indonesia; KAZ = Kazakhstan; KIR = Kiribati; KOR = Republic of Korea; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; MYA = Myanmar; NAU = Nauru; NEP = Nepal; PAK = Pakistan; PAL = Palau; PNG = Papua New Guinea; PHI = Philippines; PRC = People's Republic of China; RMI = Marshall Islands; SAM = Samoa; SOL = Solomon Islands; SRI = Sri Lanka; TAJ = Tajikistan; TAP = Taipei, China; THA = Thailand; TIM = Timor-Leste; TKM = Turkmenistan; TON = Tonga; TUV = Tuvalu; UZB = Uzbekistan; VAN = Vanuatu; VIE = Viet Nam.

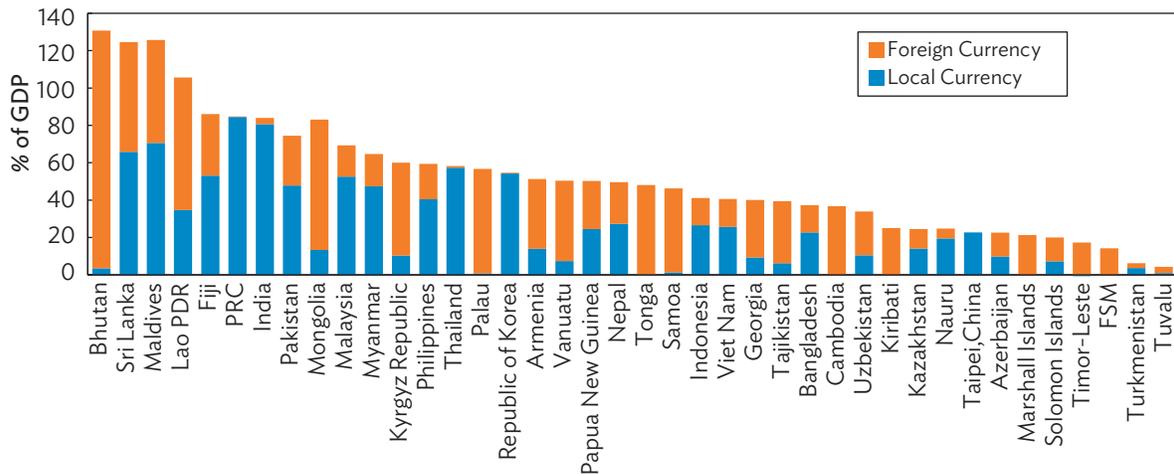
Notes:

1. Combined Shock Scenario assumes economic growth rates in 2022–2025 are half those assumed by the baseline scenario, fiscal deficit-to-GDP is equivalent to average 2020–2022 baseline level through to 2025, exchange rate depreciation in 2023 is equivalent to largest depreciation experienced since 2013, and a doubling of effective interest rates on new and rollover (25% of debt stock) debt per year.
2. Primary balance and interest expense for 2022 and 2025 of Sri Lanka are computed based on International Monetary Fund's World Economic Outlook (April 2022) estimates. Growth projections are from Asian Development Bank's Asian Development Outlook Supplement (December 2022) and International Monetary Fund's World Economic Outlook (October 2022). Due to ongoing debt relief and restructuring negotiations, this figure is merely notional and will be subject to revisions once their outcome is determined.

Sources: Authors' projections using Asia Sovereign Debt Monitor Database based on Asian Development Bank's *Asian Development Outlook Supplement* (December 2022) and International Monetary Fund's *World Economic Outlook* (April and October 2022).

corporations, firms, and households. In some economies, such as the Republic of Korea, the PRC, Thailand, Malaysia, and Viet Nam—besides the financial centers Singapore and Hong Kong, China, of course—the magnitudes at stake dwarf government's own liabilities. And in most countries, firms and households had to borrow to survive the pandemic hardship and are now facing repayment conditions far more burdensome than expected. Should economic growth falter and dry up companies' revenues and increase unemployment of indebted households, while rising interest rates compress interest-coverage ratios for companies and increase mortgage payments for households, governments would have to step in and absorb some of these liabilities into their own balance sheets, whether directly or to prop up financial sectors. If, against such a backdrop, housing and asset prices were to collapse and foreign

**Figure 8: Public Debt, by Currency Composition, 2022**

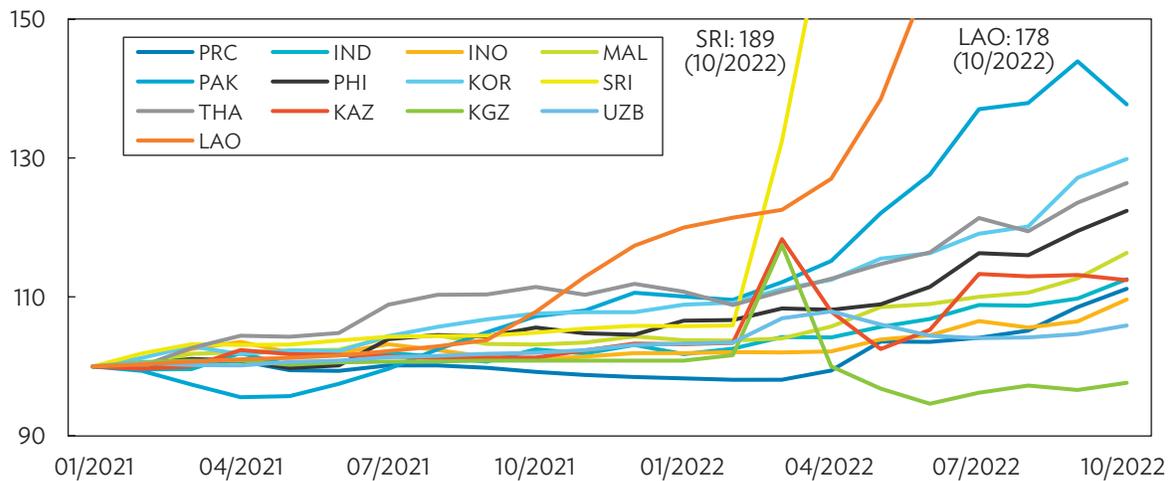


FSM = Federated States of Micronesia, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

1. Off-chart: Brunei Darussalam; the Cook Islands; Hong Kong, China; Niue; Singapore.
2. For missing 2022 share of foreign currency denominated public debt data, we use latest year available.
3. Public debt baseline figures for 2022 of Sri Lanka is computed based on International Monetary Fund's World Economic Outlook (April 2022) estimates and growth and inflation projections from Asian Development Bank's Asian Development Outlook Supplement (December 2022). Due to ongoing debt relief and restructuring negotiations, this figure is merely notional and will be subject to revisions once their outcome is determined.

Sources: Authors' estimations using Asia Sovereign Debt Monitor Database based on Asian Development Bank's *Asian Development Outlook Supplement* (December 2022) and International Monetary Fund's *World Economic Outlook* (April and October 2022).

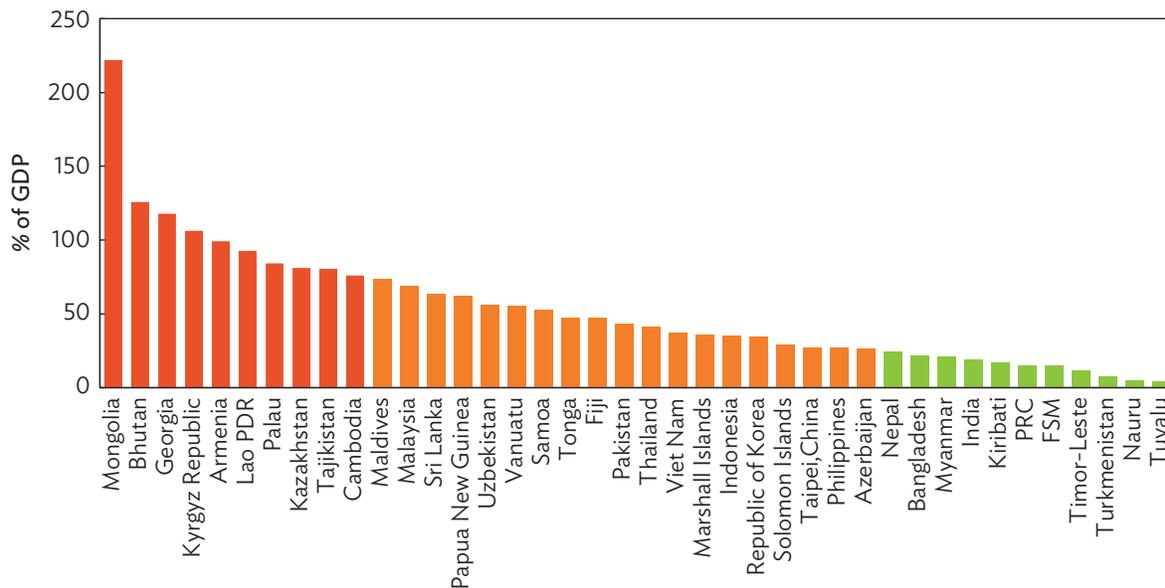
**Figure 9: Exchange Rate LCU/\$ January 2021=100**



IND = India; INO = Indonesia; KAZ = Kazakhstan; KOR = Republic of Korea; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MAL = Malaysia; PAK = Pakistan; PHI = Philippines; PRC = People's Republic of China; SRI = Sri Lanka; THA = Thailand; UZB = Uzbekistan.

Source: Authors' calculations using data from CEIC Global Database.

**Figure 10: External Debt, 2021**



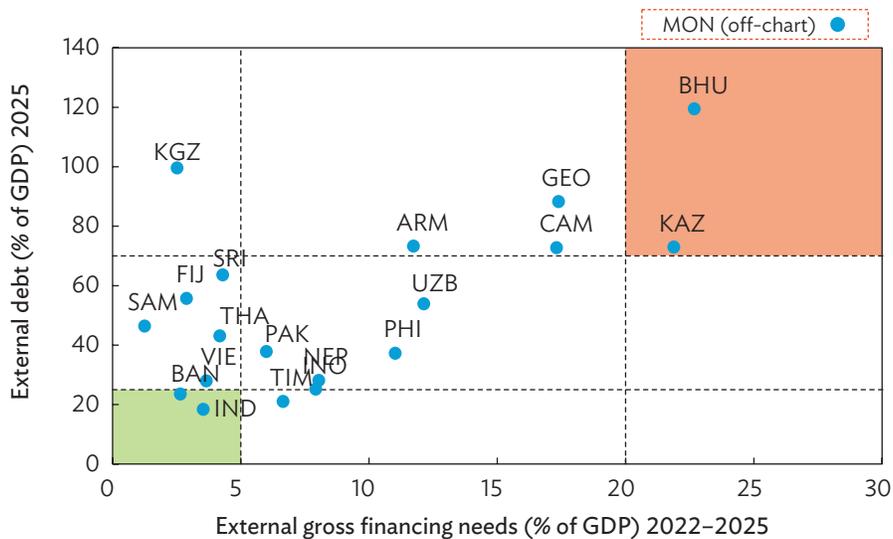
FSM = Federated States of Micronesia, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Notes:

- Off-chart: Brunei Darussalam; the Cook Islands; Hong Kong, China; Niue; Singapore; Turkmenistan.
- Thresholds for external debt are 70% of GDP (red or high) and 25% of GDP (low or green).

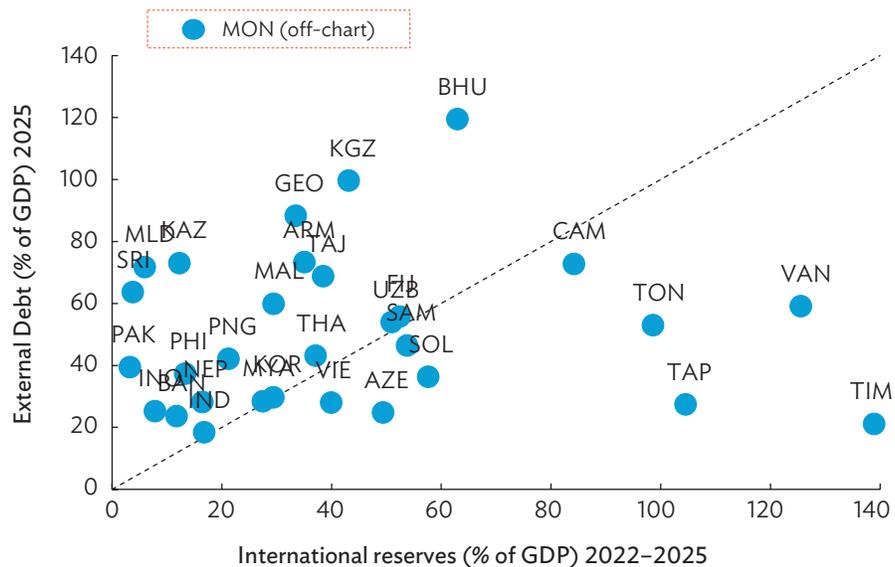
Sources: Authors' calculations using Asia Sovereign Debt Monitor Database based on International Monetary Fund's *World Economic Outlook* (October 2022), *World Bank 2022 International Debt Report*, and World Development Indicators.

**Figure 11: External Debt and External Gross Financing Needs**



Continued on next page

continued

**Figure 12: External Debt and International Reserves**

ARM = Armenia; BAN = Bangladesh; BHU = Bhutan; CAM = Cambodia; COO = Cook Islands; FIJ = Fiji; FSM = Federated States of Micronesia; GEO = Georgia; GDP = gross domestic product; GFN = gross financing needs; IND = India; INO = Indonesia; KAZ = Kazakhstan; KIR = Kiribati; KGZ = Kyrgyz Republic; KOR = Republic of Korea; LAO = Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; MYA = Myanmar; NAU = Nauru; NEP = Nepal; PAK = Pakistan; PAL = Palau; PHI = Philippines; PNG = Papua New Guinea; PRC = People's Republic of China; RMI = Marshall Islands; SAM = Samoa; SOL = Solomon Islands; SRI = Sri Lanka; TAJ = Tajikistan; TAP = Taipei, China; THA = Thailand; TIM = Timor-Leste; TKM = Turkmenistan; TON = Tonga; TUV = Tuvalu; UZH = Uzbekistan; VAN = Vanuatu; VIE = Viet Nam.

**Notes:**

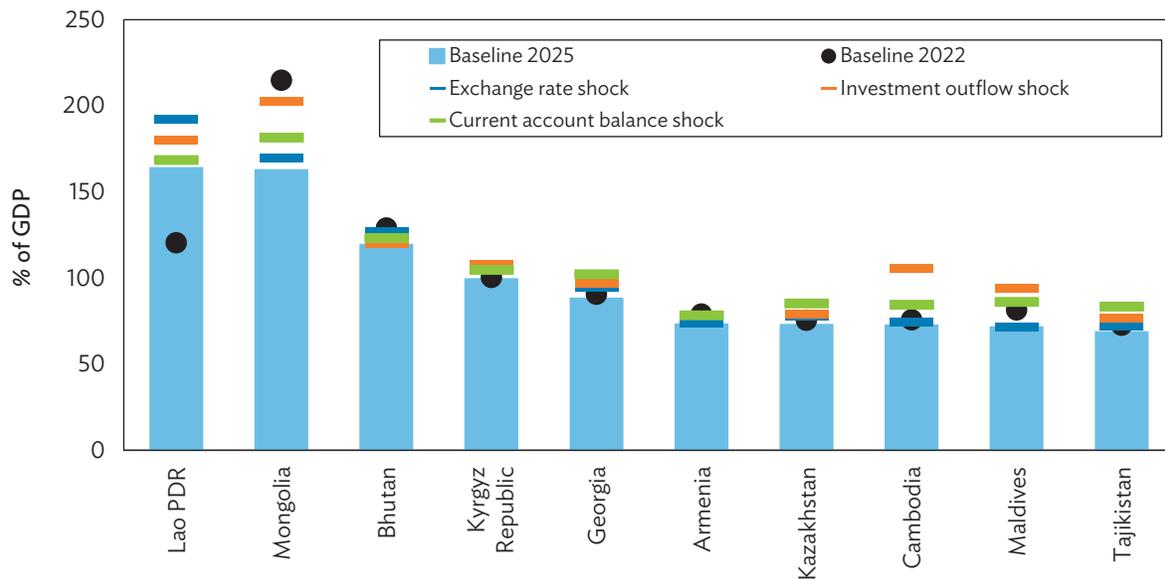
1. Off-chart: Brunei Darussalam; the Cook Islands; Hong Kong, China; Mongolia; the Marshall Islands; Nauru; Niue; Palau; Singapore; Turkmenistan.
2. Thresholds for external debt are 70% of GDP (high) and 25% of GDP (low).
3. Benchmark for gross financing needs is 5% of GDP (low) and 20% of GDP (high).
4. External debt baseline figures for 2025 of Sri Lanka is computed based on World Bank's 2022 International Debt Report and Asia Sovereign Debt Monitor Database balance of payments projections based on latest country data available from Central Bank of Sri Lanka (<https://www.cbsl.gov.lk/en/statistics/statistical-tables/external-sector>). Due to ongoing debt relief and restructuring negotiations, this figure is merely notional and will be subject to revisions once their outcome is determined.

Sources: Authors' projections using Asia Sovereign Debt Monitor Database based on International Monetary Fund's *World Economic Outlook* (October 2022), *World Bank 2022 International Debt Report*, Central Bank of Sri Lanka's External Sector Statistics, and World Bank World Development Indicators.

investors rushed to exit, this could conjure up a broader crisis in Asia and elsewhere, spreading among emerging and frontier economies like falling dominoes (**Figures 14 and 15**).

Even absent such a perfect storm scenario, it is increasingly difficult to envisage just how debt ratios could be kept in check and distress averted indefinitely in a global environment that hampers growth while raising the need for and cost of fiscal interventions at this crucial juncture where sustainability of public finances is premised on exactly the opposite to happen. At best, diligent policy and continuing albeit more onerous access to commercial financing will help weather rising pressures in the emerging markets in the region, especially where local bond markets and financial systems have gained the necessary depth and solidity to withstand or at least cushion impacts on the wider economies. Meanwhile, official development assistance, both bilateral and multilateral, is being called upon to keep lower-income countries afloat with rolled-over support and relief where necessary. None of it will be easy navigating by the governments, central banks, and international institutions called to the challenge.

**Figure 13: External Debt—Baseline and Shock Scenarios**



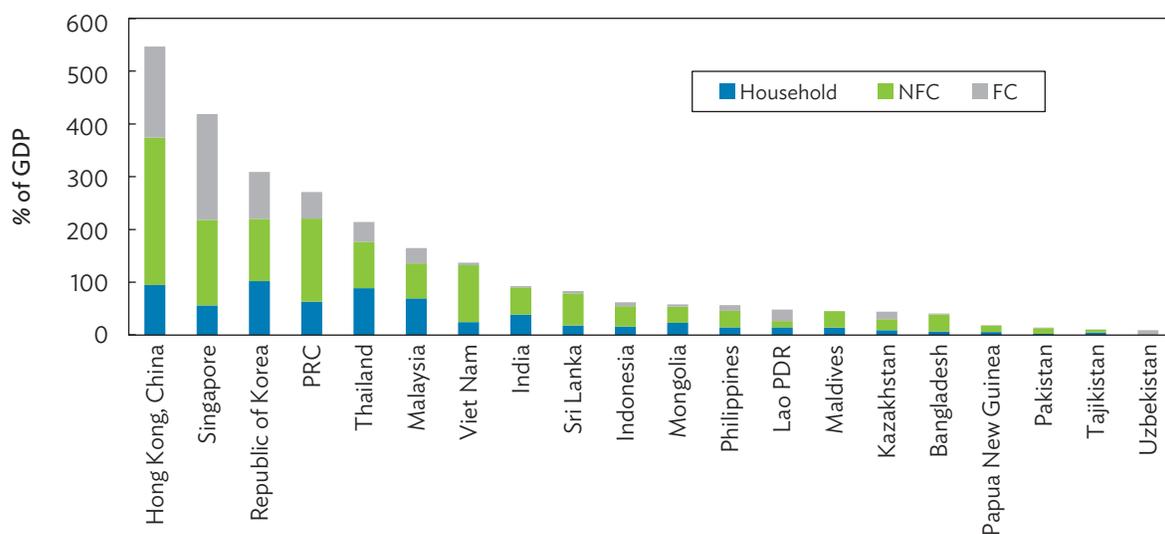
GDP = gross domestic product, Lao PDR = Lao People’s Democratic Republic.

Notes:

- Shows economies with highest level of baseline external debt (% of GDP) by 2025.
- Exchange rate shock: Assumes the largest depreciation in the past 4 years (2019 to 2022) applied to 2023.
- Investment outflow shock: Assumes the largest outflow during the last 4 years applied to 2023.
- Current account balance shock: Assumes the lowest growth on exports, primary income, and secondary income during the last 4 years applied to 2023.

Sources: Authors’ projections using Asia Sovereign Debt Monitor Database based on Asian Development Bank’s *Asian Development Outlook Supplement* (December 2022), International Monetary Fund’s *World Economic Outlook* (October 2022), and *World Bank International Debt Report 2022*.

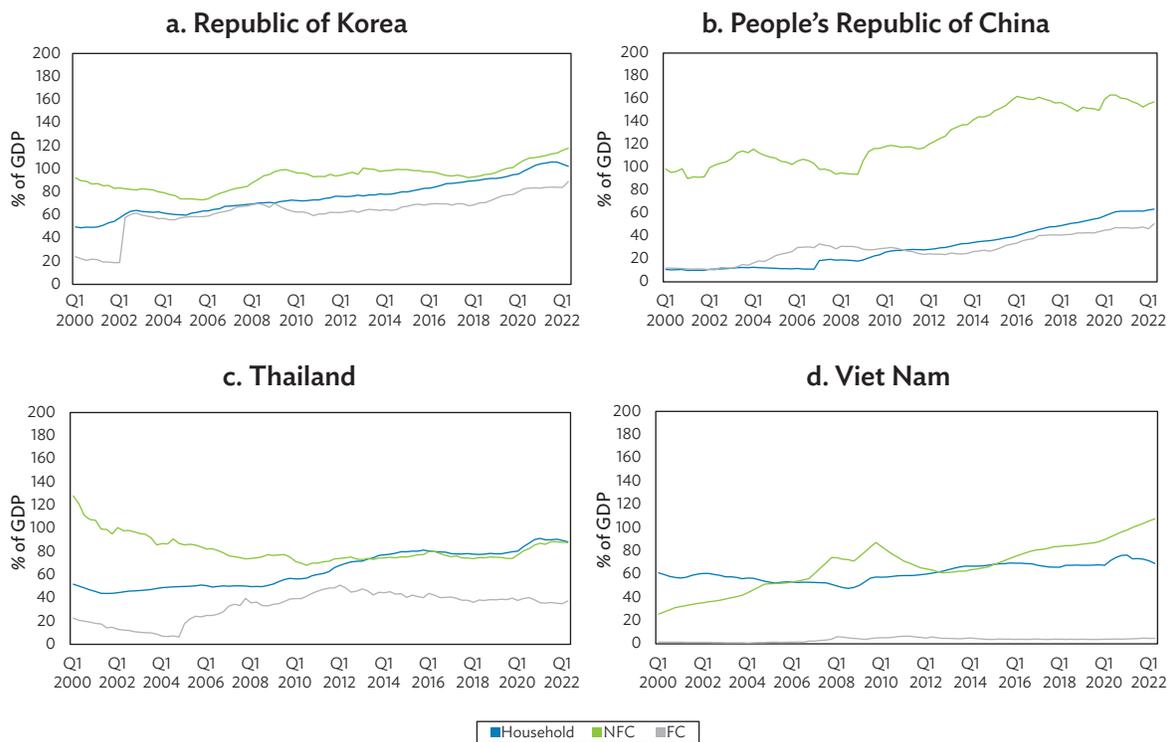
**Figure 14: Private Debt, Quarter 2 2022**



FC = financial corporates, GDP = gross domestic product, HH = household, Lao PDR = Lao People’s Democratic Republic NFC = nonfinancial corporates, Q = quarter.

Note: For Bangladesh, Kazakhstan, the Lao PDR, Mongolia, Maldives, Papua New Guinea, Sri Lanka, Tajikistan, and Uzbekistan, data is as of 2021 Q4.

Source: Authors’ calculations using data from Institute of International Finance (IIF) Global Debt Monitor Database (accessed 15 November 2022).

**Figure 15: Evolution of Private Debt—2000 Quarter 1 to 2022 Quarter 2**

FC = financial corporates, GDP = gross domestic product, NFC = nonfinancial corporates, PRC = People's Republic of China, Q = quarter.  
 Source: Authors' calculations using data from Institute of International Finance (IIF) Global Debt Monitor Database (accessed 15 November 2022).

## IV. SOVEREIGN DEBT HEAT MAPS FOR ASIA AND THE PACIFIC

Complementing the projection of debt ratios and scenario analysis, debt sustainability assessment (DSA) typically involves a range of indicators suitable to detecting vulnerabilities in relation to a country's debt profile, economy, and institutions more broadly. For example, the IMF's Sovereign Risk and Debt Sustainability Framework for Market-Access Countries (SRDSF) and Debt Sustainability Analysis for Market-Access Countries (MAC-DSA) routinely assess debt levels, gross financing needs, and a multitude of debt profile indicators against early warning benchmarks. So does the Debt Sustainability Framework for Low-Income Countries (LIC-DSF) in relation to a concessional financing context, where debt-carrying capacity thresholds and sustainability assessments crucially hinge upon multilateral donors' assessment of a country's institutional quality and policy performance.<sup>6</sup>

<sup>6</sup> Depending on a country's eligibility for concessional financing, its public and external debt sustainability is assessed by either the joint International Monetary Fund (IMF) – World Bank's Debt Sustainability Framework for Low-Income Countries (LIC-DSF), or the Sovereign Risk and Debt Sustainability Framework for Market-Access Countries (SRDSF), which is being rolled out to gradually replace the Debt Sustainability Analysis for Market-Access Countries (DSA MAC). Country DSAs are performed routinely (typically annually, or less for countries undergoing an IMF program such as the Extended Fund Facility) and enshrined in program documents or country reports such as IMF's Article IV. The DSA frameworks are described here: <https://www.worldbank.org/en/programs/debt-toolkit/dsf>; <https://www.imf.org/-/media/Files/Publications/PP/2022/English/PPEA2022039.ashx>; <https://www.imf.org/external/pubs/ft/dsa/mac.htm>.

Heat maps reflect an even broader range of macro-fiscal and other indicators with a bearing on public and external debt sustainability. While heat maps do not compare to the depth of insights and methodological rigor provided by formal DSA analysis nor to the granular, descriptive risk profiling conducted by credit rating agencies, they do help identify, *prima facie*, where vulnerabilities are present and risks may be highest, especially when the focus of analysis is on comparison across economies. Heat maps have found increasing application during recent years, such as Moody's debt heat map highlighting risks across the emerging markets, or the World Bank's Public Debt Reports Heatmap, assessing public debt reporting practices among countries qualifying for concessional access to International Development Association loans (IDA). However, no analysis in existence quite adequately covers the breadth of economies and debt sustainability indicators necessary for a heat map across the ADB developing members.

We previously set out to devise an Asia and the Pacific regional heat map that would highlight sources of potential risk for public debt sustainability and identify economies where vulnerabilities appear to be most prominent (Ferrarini and Dagli 2022). Here we expand heat map analysis by involving a far broader range of indicators, especially in relation to external debt vulnerability, for which we generate a heat map separate to public debt. In that regard, it should be noted that external debt indicators and projections are far less reliable than those in relation to public debt, given heavy reliance on trade, exchange rate, and other balance of payments forecasts that tend to be erratic. We also enhance our approach to public debt by integrating its heat map with the ASDM debt ratio forecasts outlined in the previous section. It thus reflects the drivers of debt according to the latest quarterly macroeconomic and fiscal forecasts, which are amenable to periodic updates in partial circumvention of the other stale nature of annual debt statistics and indicators, released with significant delay. We expand the time dimension of analysis to compare indicators before, during, and after the pandemic, while also simplifying our methodology as it applies to indicator combinations and threshold analysis. These methods are described in **Box 2** and further in **Appendix 2**, and the data sources underlying heat maps are listed in **Appendix 3**.

A first heat map, shown in **Table 1**, visualizes core indicators pertaining to public debt, external debt, macro-financial, and ratings. It covers 43 economies with sufficient data available across the relevant indicators, with white cells denoting missing data. Economies are grouped according to ADB's Classification and Graduation Policy, which distinguishes by their eligibility for concessional financing into Group A (fully), B (partly), and C (not eligible).<sup>7</sup> To a large extent, this overlaps with the World Bank Group's classification of countries that are eligible for its IDA concessional lending window, as well as with the IMF's list of countries with access to its concessional financing option, the Poverty Reduction and Growth Trust (PRGT). The latter are often referred to as "lower-income countries" (LIC)<sup>8</sup> and are those whose debt sustainability gets assessed through the LIC-DSF, rather than the MAC-DSA or SRDSF applied to the so-called "market-access countries" (MAC). The shades in the first column of **Table 1** reveal that all Group A and most of Group B countries are classified as LIC by the IMF, while this applies to no economy of Group C. Within groups, economies are simply shown in alphabetical order.

The core vulnerabilities arising out of **Table 1** are most readily distinguished through the aid of Venn diagrams. With regard to public debt, **Figure 16** highlights four dimensions of vulnerability for 2022–2023 estimates, in relation to a borrowing country's (i) solvency, or the public debt stock relative to the size of its economy; (ii) liquidity, or the interest burden of servicing the debt outstanding; (iii) gross financing needs, or the necessity to keep borrowing and accumulating debt; and (iv) fiscal stance, or the difference between the actual primary deficit against a debt-stabilizing one when the nominal interest-economic growth rate dynamics are accounted for. Only shown here are countries where indicators fall within the

<sup>7</sup> On ADB's developing members classification and lending policy rates, see <https://www.adb.org/what-we-do/public-sector-financing/lending-policies-rates>.

<sup>8</sup> The lower-income or what the IMF also refers to as the "low-income" countries are not confounded with the narrower category of low-income countries according to the World Bank Group, which are those with 2021 gross national income per capita of \$1,085 or less.

## Box 2: Heat Map Thresholds

Our heat map analysis determines thresholds against which the relevant risk indicators can be distinguished into a low, moderate, or high category. Thresholds are identified either along the relevant literature (UNDP [2021], IMF [2022d])<sup>a</sup> or, where none is available, are based on percentile distributions across the economies included in the analysis. For example, thresholds listed here below in relation to the heat map in Table 1 show that public debt as a share of gross domestic product (GDP) classifies economies according to whether this ratio falls below 35%, above 70%, or somewhere between these thresholds, which economies are assigned to according to International Monetary Fund's (IMF) assessment of debt carrying capacity, ranging from weak ( $\leq 35\%$ ) to high ( $\geq 70\%$ ). Similarly, thresholds for gross financing needs are based on IMF established practice, which sets the threshold at 10% of GDP or higher for emerging economies, and at 15% or higher for advanced economies, which

are thus considered at heightened risk and requiring higher scrutiny.

For indicators without a reliable reference in the literature or from established practice, we use their distributions' 75th percentile, 50th percentile, and 25th percentile cutoffs, and compute simple averages across economies to determine what are the high, moderate, and low thresholds against which to assess risk indicators. For example, "Long-term PPG Debt" is assigned the thresholds 15% and 45% of GDP to distinguish low, moderate, and high risk, on the basis of the 25th and 75th percentile (approximate) value of this indicator's distribution. For "Market Lending Rates," the thresholds are approximated at 5% to mark the 25th percentile and at 10% for the 75th.

For a full list of indicator, thresholds, and sources of data in relation to all the heat maps presented in this paper, see Tables A2 and A3.

### Headline Indicators and Thresholds

Indicator		Thresholds		
		Low	Moderate	High
<b>Public Debt</b>	Public Debt (% of GDP)	$x \leq 35$	$35 < x < 70$	$x \geq 70$
	Primary Fiscal Balance (% of GDP)	$x \geq 0$	$0 > x > -3$	$x \leq -3$
	Interest-Growth Differential (% of GDP)	$x \leq -1$	$-1 < x < 0$	$x \geq 0$
	Primary Gap	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Gross financing needs (% of GDP)	$x \leq 10$	$10 < x < 15$	$x \geq 15$
	Interest payments (% of Revenues)	$x \leq 5$	$5 < x < 10$	$x \geq 10$
<b>External Debt</b>	External Debt (% of GDP)	$x \leq 25$	$25 < x < 75$	$x \geq 75$
	Long-term PPG Debt (% of GDP)	$x \leq 15$	$15 < x < 45$	$x \geq 45$
	Long-term PNG Debt (% of GDP)	$x \leq 10$	$10 < x < 20$	$x \geq 20$
	Short-term Debt (PPG and PNG) (% of GDP)	$x \leq 1$	$1 < x < 5$	$x \geq 5$
	PPG Debt service (% of Exports)	$x \leq 1$	$1 < x < 5$	$x \geq 5$
	PPG Interest payments (% of Exports)	$x \leq 7$	$7 < x < 15$	$x \geq 15$
	PPG Debt Service owed to Commercial Creditors (% of PPG Debt Service)	$x \leq 5$	$5 < x < 10$	$x \geq 10$
	External Gross Financing Needs (% of Exports)	$x \leq 50$	$50 < x < 100$	$x \geq 100$
<b>Macro-Financial</b>	Current Account Balance (% of GDP)	$x \geq 0$	$0 > x > -5$	$x \leq -5$
<b>Risk Ratings</b>	Depreciation of the Real Exchange Rate (% Change)	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Inflation Rate (ADO) (%)	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Nonperforming Loans (% of Total Loans)	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Market Lending Rates (%)	$x \leq 5$	$5 < x < 10$	$x \geq 10$
	Credit rating <sup>a</sup>	$x \leq 10$	$10 < x < 5$	$x \geq 5$
	IMF Risk Rating (lower-income economies) or	Low	Moderate	High
	EMBI Spread (market-access economies) (Basis Points)	$x \leq 200$	$200 < x < 600$	$x \geq 600$

ADO = Asian Development Outlook, GDP = gross domestic product, PPG = public and publicly guaranteed, PNG = private nonguaranteed.

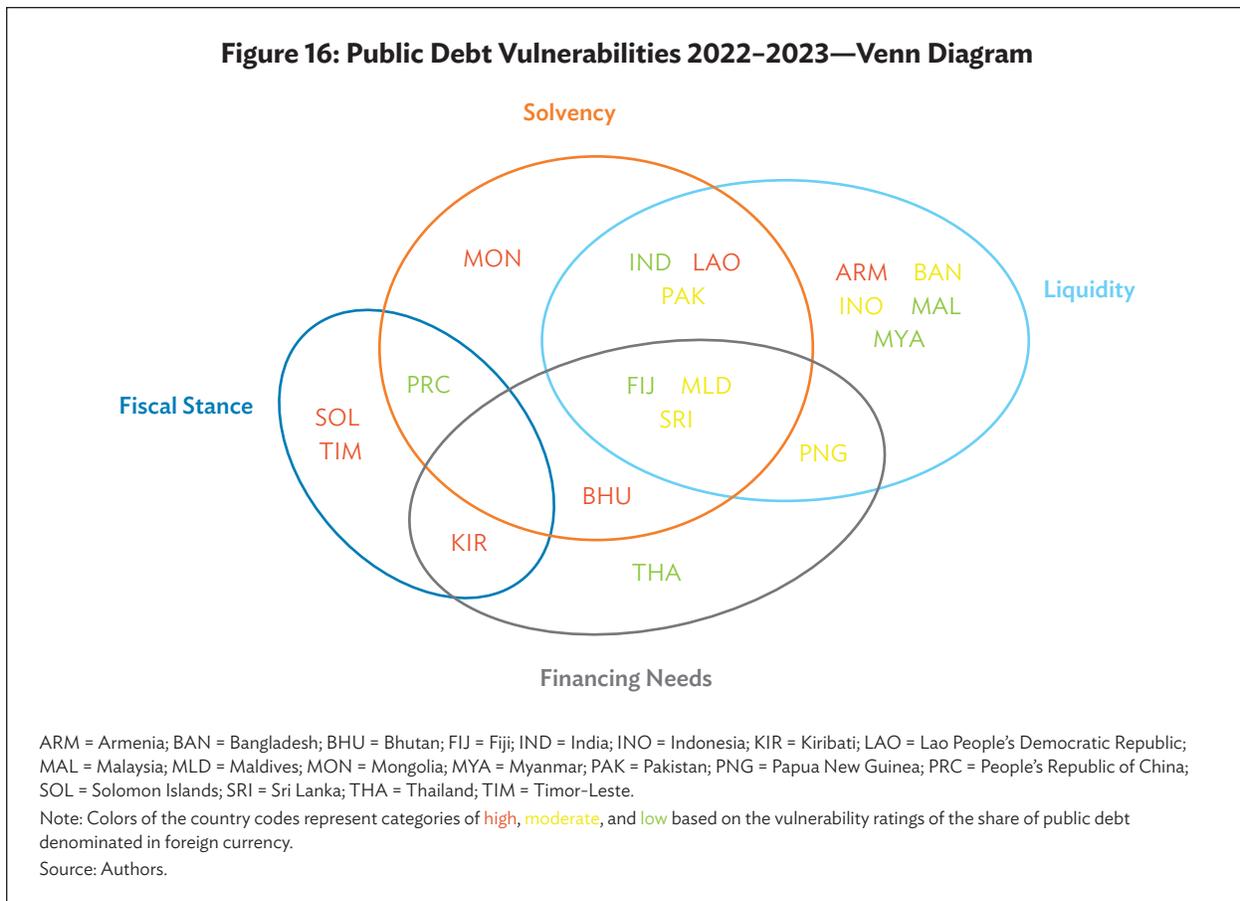
Note:

<sup>a</sup> Simple average of alpha numeric credit rating scores from Moody's, S&P, and Fitch converted to numerical scale of 0 to 20, 20 being the highest.

\* UNDP. 2021. "Sovereign Debt Vulnerabilities in Developing Economies." *Policy Brief*. New York. <https://www.undp.org/library/dfs-sovereign-debt-vulnerabilities-developing-economies>; IMF. 2022. *Global Debt Monitor*. <https://www.imf.org/external/datamapper/datasets/GDD> (accessed 15 December 2022).

Source: Authors.





high-risk category.<sup>9</sup> For example, in terms of size, government debt as a share of GDP is largest in Bhutan (129%), Sri Lanka (125%), Maldives (126%), the Lao PDR (106%), Fiji (86%), India (84%), the PRC (82%), Mongolia (81%), and Pakistan (76%). While the sheer size of government debt in each of these countries is enough to get them on a watch list, solvency concerns will be significantly more pressing for those where debt is denominated predominantly in foreign currency and/or held by foreign residents (labeled in red) compared to where it is mostly domestic (in green) or a mix of both (in yellow) and with currency risks correspondingly less incisive. Along this metric then, high debt in Mongolia and the Lao PDR would be of greater concern than that in Fiji or India, which rely more heavily on domestic debt.

Another core aspect of vulnerability on top of the size of public debt is its burden as captured by interest payments, which further highlights notable differences among the high-debt countries. Interest payments as a share of fiscal revenues are estimated to be highest in Sri Lanka (63%),<sup>10</sup> Pakistan (41%), India (29%), the Lao PDR (21%), Fiji (17%), and Maldives (12%); but far less so in Mongolia (6%), Bhutan (6%), and the PRC (4%), despite these countries' relatively high debt ratio. Conversely, countries such as Bangladesh (23%) and Indonesia (15%) pay high shares of interests out of fiscal revenues although their debt stocks are comparably low. Again, country label colors reveal the share of government debt denominated in foreign currency and held by foreign residents, which bears on interest bills' susceptibility to exchange rate fluctuations. In both Armenia and the Lao PDR, labeled red, this ratio exceeds 65%, while in Pakistan, Maldives, and Indonesia (yellow), it is somewhere between 30% and 45%. In Malaysia and Myanmar (green), the ratio falls between 20% and 40%, while in India, it is below 5%.

<sup>9</sup> Excluded from these Venn diagrams are Singapore and Hong Kong, China, for the reasons mentioned (Footnote 2).

<sup>10</sup> Ongoing negotiations about the extent of debt relief may result in significant restructuring and alleviated terms applying to Sri Lanka's debt outstanding, which would reflect accordingly in the heat map indicators, looking forward.

Yet another layer of liquidity concerns gets captured by the line encircling country labels with high gross financing needs, which are a country's borrowing requirements to cover for fiscal deficits (including interest payments) and amortizations falling due. As a ratio to GDP, these are most pronounced in Thailand (25%), followed by Maldives (20%), Sri Lanka (19%), Papua New Guinea (18%), Kiribati (18%), Bhutan (18%), and Fiji (16%). Apart from heightened rollover risk, which by itself is a concern against a backdrop of rising interest rates and tightening market access, these countries' borrowing requirements are such as to exert continuing upward pressure on their debt stocks and associated risks.

The overlap of solvency, liquidity, and gross financing needs points to a concentration of pressures on all three fronts in Sri Lanka, Maldives, and Fiji, and on at least two counts in India, the Lao PDR, and Pakistan, as well as in Kiribati, Bhutan, and Papua New Guinea on account of different combinations. Each of these countries faces heightened debt outstanding or will have to service or rollover large portions of debt. Other countries, notably the PRC, are expected to also hold a fiscal stance that will push up their debt ratio. Indeed, the PRC gets picked up by this fourth vulnerability circle, by expectations of having high government debt and a primary deficit that exceeds the level compatible with the stabilization of its debt ratio given the prevailing rates of economic growth and interest rates estimated by the ADO and WEO for 2022 and 2023. Put differently, the PRC's debt ratio is expected to grow further, unless the Government of the PRC were to rein in fiscal deficits, accelerate economic growth, or force lower interest rates on its predominantly domestic debt, vis-a-vis current forecasts. The same, in essence, is true of Kiribati, Solomon Islands, and Timor-Leste. Not so for the vast majority of economies in the region, where a combination of at least partial fiscal retrenchment and a shrinking yet favorable interest-growth differential is expected still to push debt ratios down in the near term.

Vulnerabilities are multifaceted and they combine differently in relation to each individual economy. While Venn diagrams aid the visual inspection of results, a more thorough identification of risks cannot transcend the comparative assessment at the more granular level of the color-codes and indicator values in the heat maps themselves. Reducing this information to an overall index of vulnerability can be done, of course, but the outcome will be sensitive to the choice of indicators and cutoffs, and inevitably entail a significant loss of nuance and insight. With these caveats in mind, **Table 2** lists economies ranked by a simple average across the indicators underlying the public debt Venn diagram for a most synthetic expression of public debt vulnerabilities across the region. The ranking roughly aligns with the foregoing discussion, but its interpretation certainly benefits from a fuller consideration of all the heat

**Table 2: Public Debt Vulnerabilities 2022–2023—Ranking Overall**

High	Moderate			Low
Sri Lanka	Papua New Guinea	Kiribati	Palau	Marshall Islands
Lao PDR	Mongolia	Kyrgyz Republic	Uzbekistan	Nepal
Maldives	India	Myanmar	Cambodia	Samoa
Bhutan	Armenia	Georgia	Tonga	FSM
Fiji	Bangladesh	Indonesia	Tuvalu	Azerbaijan
Pakistan	Philippines	Kazakhstan	Vanuatu	Republic of Korea
	Thailand	Timor-Leste	Malaysia	Turkmenistan
	Viet Nam	Solomon Islands	Taipei,China	Brunei Darussalam
	PRC	Tajikistan		

FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

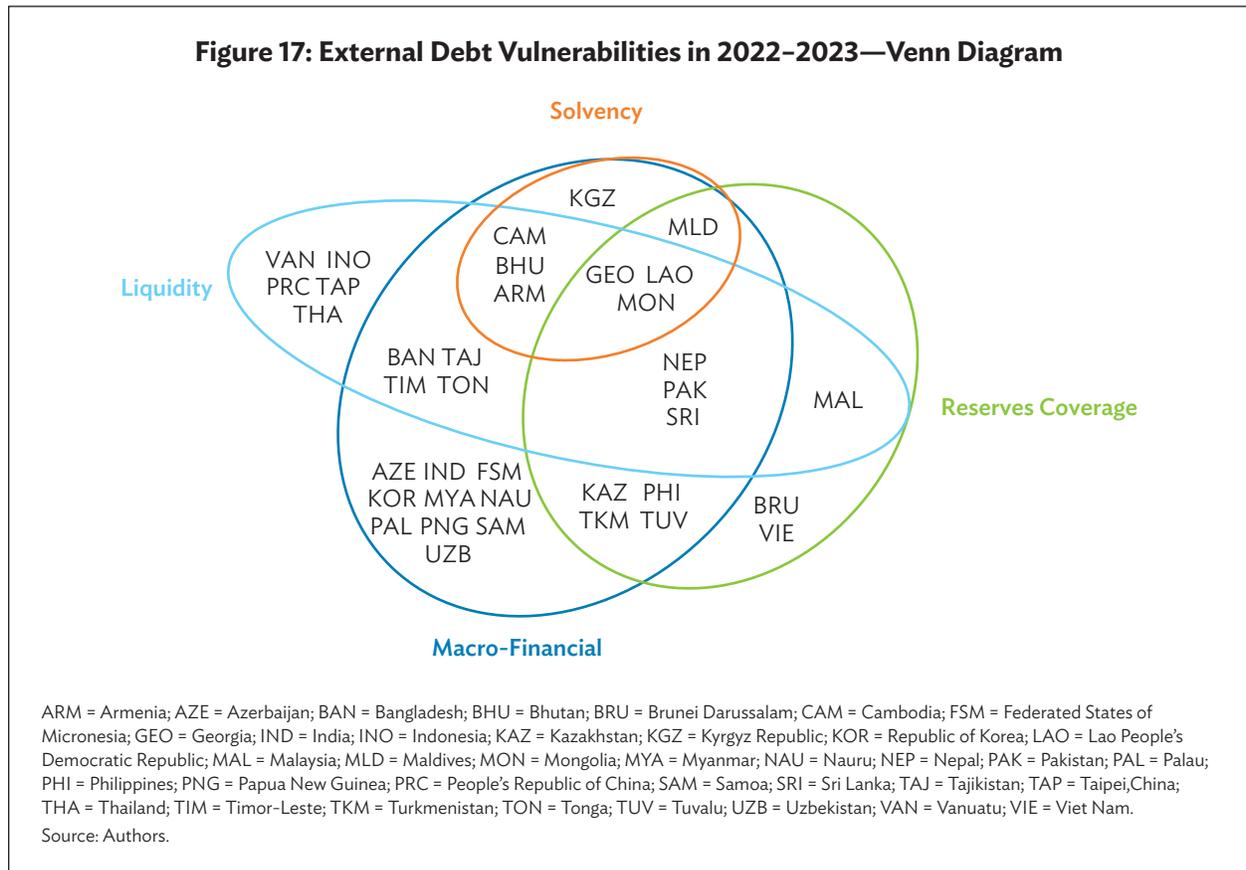
Notes: Economies are ranked based on their average scores derived from a rating of 1 = high, 0.5 = moderate, 0 = low on indicators of public debt used in Figure 16. They are listed in order of scores from high to low per group (top to bottom, left to right).

Source: Authors.

map indicators, including the recognition of factors specific to individual economies, such as those listed in the outermost column of **Table 1**. In particular, consider Bhutan’s public debt profile, which ends up ranked as the fourth most vulnerable in the region. In fact, most of its public debt reflects hydropower investments from India, whose government bears much of the construction, commercial, and financial risks and commits to buying electricity at a predefined price. Much of Bhutan’s public debt denominated in foreign currency is thus foreign direct investment in disguise, and it is generally found that the country’s risk profile should be considered significantly more benign (though not riskless) than its debt ratio would suggest when taken at face value.

Turning to external debt, **Figure 17** highlights economies where risks are highest according to four dimensions of vulnerabilities: (i) solvency, or the external debt stock (both public and private) as a share of GDP;<sup>11</sup> (ii) liquidity, in relation to the interest bill due on external debt and the amount of short-term debt outstanding, both as a ratio to total exports; (iii) reserves coverage, measured as the ratio of foreign exchange reserves to either the gross external financing needs, short-term debt outstanding, or total imports, whichever is the tighter constraint; and (iv) macro-financial stability, as captured by an economy’s current account deficits, rate of inflation, and real exchange rate depreciation.

As a share of GDP, external debt is highest in Mongolia (209%), the Lao PDR (132%), Bhutan (127%), the Kyrgyz Republic (99%), Georgia (91%), Maldives (79%), Armenia (78%), Cambodia (75%), and Kazakhstan (74%). In Mongolia, public and publicly guaranteed (PPG) long-term debt is comparably high (77%), but almost half the massive size of private nonguaranteed (PNG) long-term debt (121%),



<sup>11</sup> Data points about solvency and some of the other indicators in relation to external debt are released by the World Bank’s International Debt Report (IDR) with some lag. For example, IDR 2021 year-end data got released in December 2022.

reflecting also transnational company investment in its vast mining industry. Georgia, the Kyrgyz Republic, and the Lao PDR also stand out as having both large PPG and PNG long-term debt stocks outstanding. Long-term external debt ratios in Maldives and Bhutan are high almost exclusively on account of public debt, but not private debt. The opposite holds true for Kazakhstan, where the bulk of long-term external debt is owed by the private sector, not the public.

Several high-debt countries also have heightened liquidity risks, whether on account of large short-term debt (PPG and PNG) as a share of exports (Armenia, Georgia, Tajikistan, and Mongolia) or high PPG interest payments (Bhutan, the Lao PDR, and Tajikistan). Among other economies, short-term debt is a particularly high share of exports in the PRC (50%); Malaysia (43%); and Taipei, China (41%); and exceeds 25% in Bangladesh, Pakistan, and Thailand.

Often in overlap with solvency and other liquidity risks, limited foreign reserves coverage is an issue in several countries, whether in relation to external funding needs (the Lao PDR, Maldives, Mongolia, Kazakhstan, Sri Lanka, Pakistan, and Georgia), the amount of short-term debt (Armenia, Georgia, Malaysia, Maldives, Mongolia, Pakistan, and Sri Lanka), or imports (especially Maldives, Turkmenistan, the Lao PDR, among others).

Macro-financial risks are ubiquitous among countries with heightened risks otherwise, comprising all the countries with the highest external debt ratios and the majority of those with liquidity or low foreign exchange reserves. Persistent current account deficits are a major risk factor in Bhutan, Maldives, Mongolia, the Federated States of Micronesia, the Lao PDR, Nauru, Georgia, the Philippines, and Kazakhstan. Depreciating real exchange rates add to risks in the Lao PDR, Timor-Leste, Myanmar, the Republic of Korea, the Philippines, and Nauru. Galloping inflation signals macroeconomic pressures especially in Sri Lanka, Pakistan, Mongolia, the Kyrgyz Republic, Turkmenistan, and the Lao PDR.

From the perspective of the external risk profile combined, **Figure 17** points to Georgia, the Lao PDR, and Mongolia as countries where all these are present, as well as to Armenia, Maldives, Nepal, Cambodia, Bhutan, Pakistan, and Sri Lanka, with at least three areas of heightened vulnerability. Of course, several other factors will have a bearing on external debt sustainability and risks. For example, macro-financial indicators in **Table 1** point to particularly high market lending rates in several of the high-risk countries, and elevated nonperforming loans ratios in some. Meanwhile, credit ratings are unfavorable and flashing red for all the countries the financial markets widely consider as facing the greatest challenges ahead, closing them out of the commercial markets or entailing exorbitant risk premiums.

Countries' susceptibility to a wide range and varying combinations of risks notwithstanding, if they had to be reduced to a single number for a ranking across the region, the results would be somewhere along **Table 3**. Economies with unavailable data in relation to liquidity indicators (e.g., the Republic of Korea, Malaysia, Palau, and Tuvalu) are excluded from the ranking. Again, it bears keeping in mind that an analyst's reliance on such a reductive ranking would indeed come at the cost of missing out on other characteristics and idiosyncrasies, often qualitative and not amenable to easy quantification, but that are crucial to the assessment of a country's risk profile. For example, the presence of a fixed or managed exchange rate regime (FMX, as annotated in the last column of **Table 1**) as opposed to a more flexible arrangement may constitute an important aggravating factor in judging a country's risk profile overall. Such is the case of the Lao PDR's managed exchange rate regime, which tends toward overvaluation and in combination with low reserves makes the economy vulnerable to terms of trade shocks and capital flows reversals. By contrast, Georgia and Mongolia would be expected to fare better by having a floating regime, an important alleviating factor in pondering the risks of their external debt profiles. But even here, the distinction of country characteristics is far from automatic and requires an analyst's careful consideration. Take Bhutan, again, where the ngultrum's secure peg to the Indian rupee represents a special case where a fixed exchange rate regime combines with the country's special debt profile into more, rather than less external stability. Or the case of the Philippines, which ranks relatively

poorly mainly because of current account deficits, exchange rate depreciation, and low import coverage of reserves. However, the countries' vulnerabilities would appear to be milder than this ranking suggests, in view of a relatively low debt ratio and other alleviating factors characterizing its external debt profile.

**Table 3: External Debt Vulnerabilities 2022–2023—Ranking Overall**

High	Moderate		Low
Lao PDR	Nepal	Bangladesh	Turkmenistan
Mongolia	Timor-Leste	Papua New Guinea	Solomon Islands
Sri Lanka	Armenia	Vanuatu	India
Maldives	Indonesia	Tonga	Viet Nam
Pakistan	Bhutan	Samoa	PRC
Georgia	Cambodia	Fiji	Azerbaijan
Tajikistan	Philippines	Thailand	
Kazakhstan	Kyrgyz Republic	Myanmar	
	Uzbekistan		

FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PNG = private nonguaranteed, PPG = public and publicly guaranteed, PRC = People's Republic of China.

Notes: External debt includes both public (PPG) and private (PNG) debt. Economies are ranked based on their average scores derived from a rating of 1 = high, 0.5 = moderate, 0 = low on indicators of external debt used in Figure 17. They are listed in order of scores from high to low per group (top to bottom, left to right). Economies with unavailable data on liquidity indicators are excluded from the ranking.

Source: Authors.

Key among many other factors affecting a country's risk profile is the presence of a large sovereign wealth fund (SWF). Foremost in Kazakhstan, a vast oil fund sets it aside from Mongolia, another high-risk country depending largely on primary commodity exports and with no comparable SWF accumulations as of yet. Representing about 40% of its GDP, Kazakhstan's state oil fund constitutes a substantial buffer against oil price and other external shocks, compared to a country with no such reserves.<sup>12</sup> A similar case can be made in relation to the Pacific island economies, several of which have accumulated vast cash or bank deposits or other funds (e.g., Compact Trust Fund), often a multiple of their GDP and more than sufficient to extinguish their entire debt outstanding and well beyond. Clearly, such funds are typically committed to securing long-term development goals in view also of shifting bilateral long-term commitments, but their presence or not should have a bearing on the assessment of a borrower's external vulnerability, nevertheless.

Finally, the presence of large nonfinancial corporate (NFC) or household (HH) leverage in the PRC, the Republic of Korea, Malaysia, Thailand, and a few other economies adds a whole layer of concerns on top of those in relation to public and external PPG. So would the inclusion of contingent liabilities more broadly. However, such data is scarcely available among ADB regional members, its comparability is questionable at best, and any extension of the analytical boundaries of heat map analysis trades off poorly against the specificity and power of insights it may offer when based on fewer, but comparable indicators.<sup>13</sup>

<sup>12</sup> Yet, Kazakhstan's oil fund is nearly half the size of the country's private nonguaranteed debt stock, a good part of which constitutes a contingent liability to the government.

<sup>13</sup> Economies with high nonfinancial corporate (NFC) or household (HH) debt are marked in Table 1, last column. For a recent account of the difficulties involving the measurement of contingent liabilities in Asia and the Pacific, see Irwin (2022).

**Tables 4** and **5** allow for a more granular inspection of heat maps based on the latest available estimates and projections of risk indicators on public and external debt across the region. Corresponding tables in Appendix 1: **Tables A1.3** and **A1.4** on public debt, and **Tables A1.5** and **A1.6** on external debt, allow also for a comparison with indicators based on consolidated data in relation to a time before (2018–2019) and during (2020–2021) the pandemic. In relation to public debt, a number of stylized facts seem to emerge from the evidence at hand:

- (i) **The pandemic exacerbated risks and challenges across much of the region.** Fiscal policy responses to the pandemic reflect in large primary deficits by 2020–2021 from what had mostly been surpluses in 2018–2019. Jointly with faltering GDP growth, debt ratios shot up as a result in most economies and, in some of them, at double-digit rates. Growth-interest differentials shrunk or turned negative during 2020–2021, and the primary gap shot up, indicating a fiscal stance well above what would stabilize debt ratios.
- (ii) **Countries at elevated risk after the pandemic mostly have been so before.** For example, in Maldives, Sri Lanka, and Pakistan, debt ratios were high and rising already in 2018–2019, mostly driven by large primary fiscal deficits and exchange rate depreciation that more than offset economic expansion in terms of net effects on the public debt ratio. Similarly, interest payments (relative to GDP and fiscal revenues) have risen significantly since the pandemic, but most markedly in countries that had been facing high interest burdens before.
- (iii) **Debt ratios are expected to stabilize in 2022–2023.** Except in Sri Lanka, the Lao PDR, Kiribati, and the PRC, debt ratios are expected to fall or rise only moderately. Although persistently large primary deficits keep lifting debt ratios upward, real economic growth and interest rates are still largely favorable to public debt dynamics such as to push debt ratios down. Even in Maldives, GDP growth alone is expected to nearly offset the 10.8 pp rise in its government debt ratio because of primary fiscal deficits, while other macroeconomic drivers help to bring about a marginal reduction of debt by half a percentage point relative to GDP. Exchange rate pressures are expected to persist especially in the Lao PDR, Sri Lanka, and Mongolia, as a major driver of further increases in debt ratios.



Turning to **Tables 5, A1.5, and A1.6**, in relation to external debt, heat maps suggest that:

- (i) **Also on the external front, where debt is highest, this stems from a time well before the pandemic.** This is certainly true for Hong Kong, China (479%) and Singapore (423%), where extreme debt ratios have long been endemic and functional to financial centers that far exceed the tiny size of their hosting economies. Among the other countries with the highest external debt ratios in 2022–2023: Mongolia (209%), the Lao PDR (132%), Bhutan (127%), the Kyrgyz Republic (99%), Georgia (91%), Maldives (79%), Armenia (78%), Cambodia (75%), and Kazakhstan (74%) have long been among the region’s countries with the highest total external debt as a share of their economies.
- (ii) **But the pandemic has sharpened external leverage and exposure.** In some countries, most notably the Lao PDR, the pandemic has driven debt ratios significantly higher, from an already high basis. Other countries have experienced similarly sharp increases, although from a lower basis: Maldives, where external debt ratio ballooned from 46% of GDP before the pandemic to 83% in 2020–2021 and to 79% in 2022–2023, or Palau, where it more than doubled from 32% in 2018–2019 to 72% in 2020–2021 and to 73% in 2022–2023. Other notable examples are Sri Lanka, which saw this ratio climb from 60% to 65% and 72% over the same intervals; and Cambodia from 56% to 73% and to 75%.
- (iii) **The emitter, ownership, and term structure of external debt vary across highly leveraged economies and affect their vulnerability.** Other than the financial center economies, Mongolia stands out as having the highest share of private nonguaranteed (PNG) debt stock outstanding in the region, exceeding 120% of GDP in 2022–2023 and with maturity longer than 1 year. Mongolia’s huge private sector’s external leverage—mainly in relation to its mining industry—adds a layer of vulnerability from pressure to its external accounts and as a contingent liability more broadly. It comes on top the sizable share of debt owed or guaranteed by Mongolia’s public sector (PPG), amounting to 77% of GDP and the bulk of which is nonconcessional or owed to private creditors. In addition to this massive pile of long-term debt, Mongolia’s debt with maturity of a year or less is estimated at nearly 8% of its GDP or more than 13% of its exports. Private debt (55% of GDP) constitutes a major liability in the Lao PDR, adding to public debt (71% of GDP) that is mostly owed to nonconcessional official creditors or private lenders. Private debt ratios are large also in most of the high-debt countries in Caucasus and Central Asia, such as Kazakhstan (53%), the Kyrgyz Republic (39%), Georgia (35%), and Armenia (25%), as well as in Cambodia (22%). Not so in Bhutan, Maldives, and Sri Lanka, where PPG constitutes the bulk of long-term debt outstanding. They all owe large shares of debt to either nonconcessional or private creditors, raising risks in terms of rollover and from a higher cost and liquidity implications of debt outstanding.
- (iv) **Sovereign wealth funds or other country specificities affect risk profiles.** As mentioned, in the case of Bhutan, this is largely in connection to hydropower investment by the Government of India at terms akin to foreign direct investment; in Kazakhstan, a sovereign oil fund amounting to about 40% of GDP constitutes a crucial buffer to cyclical price and extraordinary shocks; in Cambodia, the largely dollarized economy reaps the government of a policy lever and markets of an important buffer against external shock’s transmission to the economy, with repercussions on fiscal sustainability.<sup>14</sup>

<sup>14</sup> Table 1, last column (“Other factors”) lists these and other economic characteristics that bear on risk profiles.

Table 5: Heat Map – External Debt, 2022-2023 or Latest Available

Market-access Lower-income	STRUCTURE												OTHER INDICATORS																				
	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023	2022-2023											
	% of GDP	PPG Long-term Debt	Concessional (Bilateral and Multilateral)	% of GDP	Nonconcessional (Bilateral and Multilateral)	% of GDP	Private Creditors	PNG Long-term Debt	Short-term Debt (PPG and PNG)	% of Exports	Short-term Debt (PPG and PNG)	% of GDP	Short-term Debt (PPG and PNG)	% of Exports	PPG Debt Service (PPG and PNG)	% of Exports	PPG Interest Payments	PPG Amortization	PPG Debt Service Owed to Commercial Creditors	% of PPG Debt Service	PPG Debt Service to PRC	Ave. on EDOD	% of Exports	External Gross Financing Needs	% of GDP	No. of Years	FX Reserves / Short-term Debt	No. of Months	FX Reserves / Imports				
<b>GROUP A</b>																																	
Bhutan	1272	1222	26.7	94.8	0.6	3.7	0.1	0.4	0.4	6.2	21.7	9.4	12.3	3.3	0.0	2.1	68.1	-210	31	529.3	15.2	21.7	9.4	12.3	3.3	0.0	2.1	68.1	-210	31	529.3	15.2	
Cambodia	75.4	35.8	22.2	13.6	0.0	21.5	16.9	22.7	16.5	29.0	9.6	2.9	0.7	2.2	50.2	1.8	53.2	-121	1.9	4.7	10.7	27.0	6.9	1.6	5.3	39.7	1.7	27.6	-201	3.1	5.9	7.5	
Kiribati	988	46.9	22.7	24.2	0.0	38.8	6.3	15.5	7.8	40.8	27.0	6.9	1.6	5.3	39.7	1.7	27.6	-201	3.1	5.9	7.5	33.6	16.8	3.6	13.2	16.7	1.5	51.3	-13.4	0.2	1.2	1.5	
Kyrgyz Republic	13.7	13.7	22.7	24.2	0.0	0.0	0.0	0.0	0.2	40.8	27.0	6.9	1.6	5.3	39.7	1.7	27.6	-201	3.1	5.9	7.5	14.1	13.2	3.0	10.3	57.0	2.5	64.0	-18.4	0.2	0.7	1.4	
FSM	1323	70.8	17.6	41.6	11.6	55.2	4.9	12.5	33.2	63.0	33.6	16.8	3.6	13.2	16.7	1.5	51.3	-13.4	0.2	1.2	1.5	33.6	16.8	3.6	13.2	16.7	1.5	51.3	-13.4	0.2	1.2	1.5	
Lao PDR	79.1	59.9	8.8	27.1	26.4	7.5	10.6	16.5	6.0	26.7	14.1	13.2	3.0	10.3	57.0	2.5	64.0	-18.4	0.2	0.7	1.4	14.1	13.2	3.0	10.3	57.0	2.5	64.0	-18.4	0.2	0.7	1.4	
Maldives	38.2	35.3	8.8	27.1	26.4	7.5	10.6	16.5	6.0	26.7	14.1	13.2	3.0	10.3	57.0	2.5	64.0	-18.4	0.2	0.7	1.4	38.2	35.3	8.8	27.1	26.4	7.5	10.6	16.5	6.0	26.7	14.1	
Marshall Islands	24.2	20.2	12.3	4.3	3.6	1.1	0.0	0.2	14.4	3.6	7.4	6.4	1.0	5.5	26.9	1.3	-2.4	9.2	-29.1	457.2	11.3	7.4	6.4	1.0	5.5	26.9	1.3	-2.4	9.2	-29.1	457.2	11.3	
Myanmar	5.1	5.1	12.3	4.3	3.6	1.1	0.0	0.2	14.4	3.6	7.4	6.4	1.0	5.5	26.9	1.3	-2.4	9.2	-29.1	457.2	11.3	5.1	5.1	12.3	4.3	3.6	1.1	0.0	0.2	14.4	3.6	7.4	
Nauru	27.6	24.3	21.7	2.5	0.0	1.0	0.9	15.2	1.4	2.3	18.8	16.7	3.9	12.8	7.4	0.9	20.7	-12.4	-10.4	1.5	18.7	18.8	16.7	3.9	12.8	7.4	0.9	20.7	-12.4	-10.4	1.5	18.7	
Nepal	44.3	36.8	22.6	14.2	0.0	0.0	0.0	0.0	21.9	0.0	13.2	12.8	1.6	0.4	1.1	51.7	1.2	6.2	-0.6	10.3	10.3	13.2	12.8	1.6	0.4	1.1	51.7	1.2	6.2	-0.6	10.3	10.3	
Samoa	32.2	9.1	8.0	1.1	0.0	15.5	3.2	11.4	49.2	0.0	13.2	12.8	1.6	0.4	1.1	51.7	1.2	6.2	-0.6	10.3	10.3	32.2	9.1	8.0	1.1	0.0	15.5	3.2	11.4	49.2	0.0		
Solomon Islands	72.6	32.8	10.1	17.4	5.4	24.3	10.2	66.2	12.3	34.2	37.4	17.0	4.8	12.2	6.1	44.2	1.3	58.0	5.6	3.4	11.2	37.4	17.0	4.8	12.2	6.1	44.2	1.3	58.0	5.6	3.4	11.2	
Tajikistan	47.3	40.0	14.3	25.7	0.0	0.1	0.0	0.0	15.2	0.5	20.6	20.6	2.8	17.8	80.9	1.0	13.1	44.9	-0.7	36.2	18.8	20.6	20.6	2.8	17.8	80.9	1.0	13.1	44.9	-0.7	36.2	18.8	
Tonga	3.1	3.1	22.6	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	2.8	1.0	1.8	20.1	2.7	-23.0	23.6	-1.5	18.4	11.4	26.2	2.8	1.0	1.8	20.1	2.7	-23.0	23.6	-1.5	18.4	11.4	
Tuvalu	73.1	49.5	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	2.8	1.0	1.8	20.1	2.7	-23.0	23.6	-1.5	18.4	11.4	73.1	49.5	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	
Vanuatu	58.2	47.6	22.6	25.0	0.0	0.0	4.3	20.2	24.0	0.0	12.1	11.0	3.0	8.0	59.4	1.1	-48.2	16.6	-8.8	24.3	29.3	12.1	11.0	3.0	8.0	59.4	1.1	-48.2	16.6	-8.8	24.3	29.3	
<b>GROUP B</b>																																	
Bangladesh	23.1	15.9	8.1	6.5	1.4	2.1	4.3	38.6	2.5	22.0	11.1	7.2	1.9	5.3	5.3	8.4	62.2	-1.8	1.5	2.6	7.5	11.1	7.2	1.9	5.3	5.3	8.4	62.2	-1.8	1.5	2.6	7.5	
Fiji	50.4	29.7	6.2	23.4	0.0	15.3	1.0	2.5	5.1	62.9	11.5	4.1	0.6	3.5	0.0	52.6	1.6	12.2	-2.8	8.0	43.8	50.4	29.7	6.2	23.4	0.0	15.3	1.0	2.5	5.1	62.9	11.5	
India	188.6	6.5	1.4	1.8	3.4	8.1	3.6	18.7	0.1	6.2	8.5	3.1	0.4	2.8	22.2	3.2	32.8	-1.9	2.9	5.0	9.6	188.6	6.5	1.4	1.8	3.4	8.1	3.6	18.7	0.1	6.2	8.5	
Mongolia	208.6	77.4	19.5	32.2	25.6	120.6	7.7	13.3	3.2	66.3	75.0	14.7	3.2	11.5	13.6	3.6	70.0	-15.6	0.6	3.1	4.5	208.6	77.4	19.5	32.2	25.6	120.6	7.7	13.3	3.2	66.3	75.0	
Pakistan	40.7	30.4	5.9	17.4	7.1	4.2	3.0	25.3	4.4	30.6	75.9	35.2	4.9	30.3	12.4	42.3	1.6	81.3	-2.9	0.4	1.1	40.7	30.4	5.9	17.4	7.1	4.2	3.0	25.3	4.4	30.6	75.9	
Papua New Guinea	51.7	22.6	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	51.7	22.6	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	51.7	22.6	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	
Palau	73.1	49.5	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	73.1	49.5	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	73.1	49.5	3.0	17.3	2.2	25.4	1.0	2.2	8.4	26.2	26.2	
Timor-Leste	17.9	15.8	2.7	13.1	0.0	0.0	0.0	0.1	10.4	53.7	30.3	30.3	6.2	24.1	0.0	1.3	188.4	-6.6	11.2	2305.6	28.9	30.3	30.3	6.2	24.1	0.0	1.3	188.4	-6.6	11.2	2305.6	28.9	
Uzbekistan	55.9	28.6	4.6	18.0	6.0	20.4	5.1	20.4	10.4	55.8	25.1	7.1	2.2	5.9	9.7	21.3	1.4	66.9	-5.5	3.1	10.0	55.9	28.6	4.6	18.0	6.0	20.4	5.1	20.4	10.4	55.8	25.1	
<b>GROUP C and Others</b>																																	
Armenia	77.7	37.5	8.2	18.5	10.8	25.3	10.9	32.7	0.2	39.2	30.0	6.9	2.0	5.0	3.4	2.3	61.9	1.6	1.2	2.6	9.2	77.7	37.5	8.2	18.5	10.8	25.3	10.9	32.7	0.2	39.2	30.0	
Azerbaijan	23.5	22.0	1.9	9.4	10.7	0.4	0.0	0.0	0.8	52.0	4.0	3.6	0.9	2.7	39.6	2.4	-36.9	24.9	-1.4	15.0	15.0	23.5	22.0	1.9	9.4	10.7	0.4	0.0	0.8	52.0	4.0		
Brunei Darussalam	15.7	2.9	0.0	0.3	2.7	4.3	8.2	50.3	13.0	30.7	6.2	1.5	0.6	0.9	22.7	2.3	61.9	1.6	1.2	2.6	9.2	15.7	2.9	0.0	0.3	2.7	4.3	8.2	50.3	13.0	30.7	6.2	
PRC	90.8	39.1	9.4	20.5	9.2	34.6	12.7	31.5	1.7	48.3	22.3	5.2	2.4	2.8	1.9	2.6	66.7	-3.3	0.9	2.2	6.8	90.8	39.1	9.4	20.5	9.2	34.6	12.7	31.5	1.7	48.3	22.3	
Georgia	478.6	3.4	143.7	331.5	178.6	143.7	331.5	178.6	1.7	48.3	22.3	5.2	2.4	2.8	1.9	2.6	66.7	-3.3	0.9	2.2	6.8	478.6	3.4	143.7	331.5	178.6	143.7	331.5	178.6	143.7	331.5	178.6	143.7
Hong Kong, China	30.4	20.5	0.8	3.8	15.9	5.1	4.1	21.1	1.8	32.2	41.8	9.5	3.3	6.3	36.8	2.8	50.5	-1.4	1.1	2.5	6.6	30.4	20.5	0.8	3.8	15.9	5.1	4.1	21.1	1.8	32.2	41.8	
Indonesia	74.0	13.5	0.1	4.1	9.4	53.2	6.4	24.8	14.1	71.1	56.0	4.6	1.4	3.2	5.3	3.1	99.5	-6.7	0.6	2.1	7.4	74.0	13.5	0.1	4.1	9.4	53.2	6.4	24.8	14.1	71.1	56.0	
Kazakhstan	58.7	23.8	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	9.2	4.6	1.9	2.7	22.3	2.5	52.6	-7.8	1.5	4.6	5.0	58.7	23.8	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	9.2	
Malaysia	27.1	16.2	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	27.1	16.2	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	27.1	16.2	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	
Philippines	35.6	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	35.6	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	35.6	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	
Republic of Korea	423.2	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	423.2	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	423.2	0.0	2.2	6.6	7.4	8.9	26.0	43.2	0.9	48.7	48.7	
Singapore	72.1	51.1	9.6	18.6	22.9	9.5	8.3	36.5	9.0	36.2	41.0	26.4	6.6	19.8	36.9	2.7	61.3	-1.6	0.2	0.4	1.3	72.1	51.1	9.6	18.6	22.9	9.5	8.3	36.5	9.0	36.2	41.0	
Sri Lanka	27.1	-0.1	0.5	0.6	6.6	19.0	14.7	25.1	16.4	35.0	5.7	0.3	0.1	0.2	2.5	0.6	32.9	-1.2	2.2	2.7	8.3	27.1	-0.1	0.5	0.6	6.6	19.0	14.7	25.1	16.4	35.0	5.7	
Taipei, China	42.4	6.6	7.6	5.0	1.1	9.7	9.1	9.7	1.4	39.8	42.4	6.6	7.6	5.0	1.1	9.7	9.1	9.7	1.4	39.8	39.8	42.4	6.6	7.6	5.0	1.1	9.7						

- (v) **Short-term debt and rollover risk is high, especially among market-access economies.** Sri Lanka; Taipei,China; the PRC; Armenia; Georgia; Pakistan; Malaysia; and Thailand all have long held substantial shares of short-term debt as a ratio to exports and to GDP. The concessional terms of official lending to lower-income countries keeps these ratios generally lower, with the notable exceptions of Tajikistan, Bangladesh, and Cambodia, where the term structure of debt substantially aggravates their risk profile. To note that short-termism is a structural vulnerability predating the pandemic, although it got accentuated in some economies, while output and exports got stalled.
- (vi) **PRC lending is most pronounced in Caucasus and Central Asia, Southeast Asia, and the Pacific.** Countries with high shares of external debt outstanding owed to the PRC as of 2019 are the Marshall Islands, the Lao PDR, Vanuatu, Samoa, Cambodia, Turkmenistan, Tonga, Myanmar, Kazakhstan, Brunei Darussalam, Tajikistan, Uzbekistan, Sri Lanka, and Papua New Guinea. Jointly with the share of debt owed to commercial lenders, this indicator proxies for non-Paris Club lending and added complexity in reaching a settlement among creditors for the case that a country necessitated debt relief.
- (vii) **The burden of external debt has been exorbitant for some countries and rising for others.** External debt service is expected to absorb 76% of Pakistan's export proceeds in 2022–2023—nearly half of which is on account of PPG debt—up from 28% in 2018–2019 and 35% in 2020–2021, when the country benefited from the Debt Service Suspension Initiative. In Mongolia, total external debt service is expected to reach 75% of exports, about 60 pp of which on account of private debt alone. Both public (26%) and private (15%) external debt service ratios have been high for Sri Lanka since well before the pandemic and it is now expected that debt relief and reprofiling negotiations will necessarily bring this down to more sustainable levels in line with the economy's reduced capacity and to allow for recovery. In Bhutan, public external debt service is expected at nearly 22% of exports in 2022–2023, up from about half that level in the 4 years prior. Also in the Lao PDR, debt service has increased substantially lately, both on account of public and private debt, and in Timor-Leste, on account of public external debt only. In all these economies, interest payments siphon off a considerable share of export revenue, and there has been a generally rising trend although not as marked as may be expected against the backdrop of rising interest rates. Partly this is explained by the time it takes for interest rate hikes to work through the debt stock as it gets gradually replenished, especially in countries with a relatively low share of external debt with variable rate (e.g., this ratio is 6% for Bhutan compared to 63% for the Lao PDR). Another reason is that exports, the core denominator in the external debt burden indicators, have bounced back considerably since the pandemic, especially among the oil and energy exporters.
- (viii) **Debt service owed to the PRC is dominant or high especially among Groups A and B countries.** About 57% of the Lao PDR's external public debt service goes to the PRC, and similarly high figures are recorded for Cambodia, Myanmar, Tajikistan, Samoa, Tonga, Vanuatu, and Pakistan. These ratios are generally up since 2018–2019 and 2020–2021, even though not by much.
- (ix) **Group C economies' commercial debt service is substantial, and increasingly so is that of poorer countries.** A rise in exposure to private creditors explains substantial shares of debt service (out of the total) going to these lenders over the years. Among the lower-income and high-debt countries, this applies to Maldives, the Lao PDR, Mongolia, and Pakistan.
- (x) **Rising interest and amortization payments, sometimes combined with persistent current account deficits, have given rise to widening external gross financing needs.** As a ratio to exports in 2022, external financing needs (EFNs) are largest in Nepal (207%), Timor-Leste (188%), Kazakhstan (100%), Pakistan (81%), Mongolia (70%), Bhutan (68%), Uzbekistan (67%), Georgia (67%), Maldives (64%), Bangladesh (62%), and Sri Lanka (61%). To the extent that financing gaps will need filling with additional borrowing, debt ratios in these countries would be expected to rise as a result, unless external balances improve above expectations.

- (xi) **Foreign exchange reserves provide insufficient coverage in several of the high-debt countries.** Especially in the Lao PDR, Pakistan, Maldives, and Sri Lanka, foreign exchange reserves provide an inadequate buffer against these countries' EFN, short-term debt, and imports, adding to the concern about the sustainability of their external debt stock. Mongolia's coverage is slightly higher, but far from providing any degree of comfort. Cambodia's and Armenia's are higher, but insufficient to instill confidence in view of a risky debt profile overall. At least under some aspects, foreign reserves buffers are not entirely reassuring also in Group C economies for example in Malaysia, where they barely cover for short-term debt.

## V. LOOKING AHEAD: EXTERNAL FINANCING NEEDS AND NEAR-TERM STRESS FORECASTS

Heat maps rely mostly on debt indicators based on sources that get updated infrequently and with considerable delay. To integrate the risk assessment provided by heat maps, this can be complemented with the analysis of balance of payments and other flow data that gets released with a lesser delay and at higher frequency than debt statistics. In addition, some early warning tool can be deployed to estimate the likelihood of economies experiencing debt distress in the near term, such as the IMF's recently developed multivariate logistic regression (logit) model for standardized risk analysis. To illustrate application in the context of ADB regional members, we assess the financing needs and sources for some of the high-risk economies identified in the heat map analysis. We then apply the IMF's logit model to assign a near-term stress rating to ADB members qualifying for Group B or C financing terms; that is, those with at least partial market access and with sufficient data available for this analysis.

### A. Funding Needs and Sources: Sri Lanka, Pakistan, Lao PDR, Mongolia<sup>15</sup>

Any significant and persistent excess in an economy's funding needs against its continued ability to access affordable and sustainable financing sources constitutes a liquidity shortage and a typical precursor of debt distress and inability to stay current on debt obligations. Sri Lanka, of course, already reached such a point in April 2022, when government declared its inability to service its foreign debts falling due for repayment, except those owed to multilateral creditors. If default has been averted elsewhere so far, it is only because of IMF emergency loans, hefty multilateral official development assistance disbursements, and lending or debt service rescheduling by the PRC to support balance of payment difficulties of its major debtors in the region.<sup>16</sup>

Creditors' nervousness reached new heights when Sri Lanka demonstrated that default may not be avoidable, after all. Attention has shifted to anticipating countries that may be next in line, especially among those that had been under international scrutiny for quite some time. For example, the IMF's External Fund Facility (EFF) had long been supporting Pakistan's dealing with a lingering balance of

<sup>15</sup> The analysis in this section draws mainly from latest IMF Article IV country reports as of 20 January 2023 and, to a lesser extent, from CEIC based on national data sources. The discussion aims to highlight some of the broader aspects concerning selected countries' external funding gaps as of late 2022. However, the interested reader would best be referred to periodical updates and latest country notes and reports, such as by the IMF, World Bank, or as prepared by the ADB's country teams of experts, for an in-depth discussion and latest data and analyses of country situations that tend to evolve continuously and sometimes abruptly.

<sup>16</sup> There is not much disclosure or transparency about such ad-hoc bilateral interventions. For examples of anecdotal evidence, see <https://www.economist.com/china/2022/08/24/faced-with-an-overseas-debt-crisis-will-china-change-its-ways> and <https://www.aiddata.org/publications/banking-on-the-belt-and-road>.

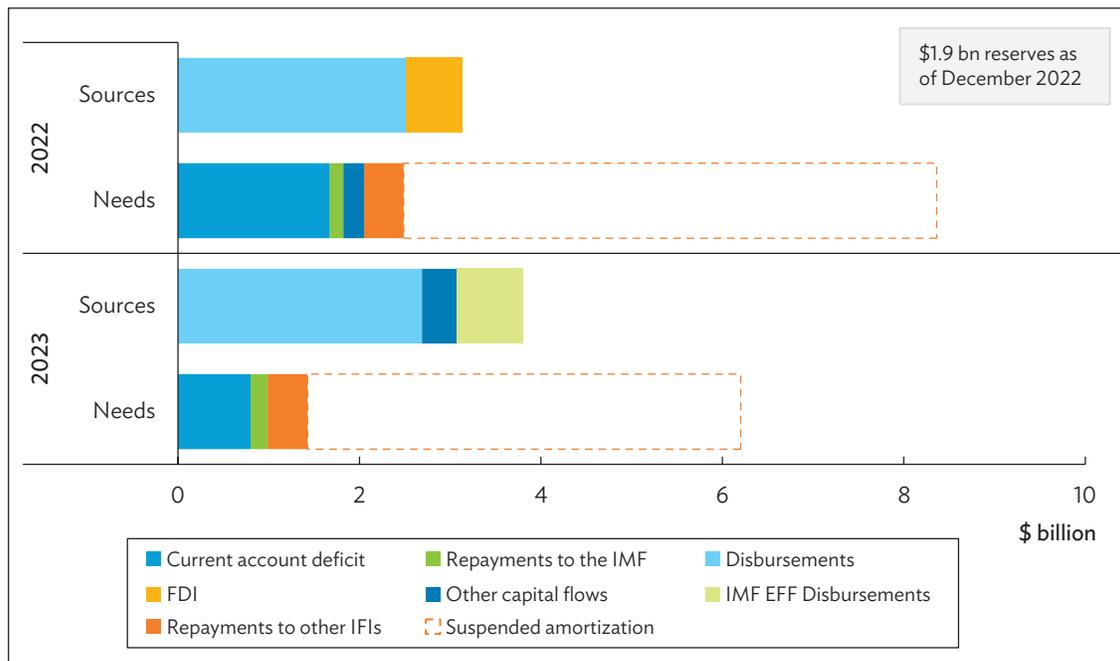
payments crisis, but investor wariness reached a whole new level when devastating floods added to an already dire economic, political, and social situation in the country and sent credit default swap spreads soaring to a massive 123% in November 2022. The Lao PDR, on the other hand, has long been battling a slow-motion liquidity crunch from high debt repayments that prompted the government to engage in talks with the PRC and other key creditors for leniency and support. Mongolia, by contrast, had been making good progress from its long-standing external financing difficulties until the pandemic hit, but the sheer size of its external debt remains a concern as it renders both its private and public sectors susceptible to disruptive forces and shocks that are well beyond the government's control.

For each of these economies, persistent current account deficits and sizable external debts outstanding result in external financing needs that require the continuing rollover of debts, whether from official concessional, bilateral semiconcessional, or commercial sources. To the extent that unfavorable macroeconomic developments, such as higher import bills or a growth slowdown—let alone any major shock or disaster—raises the financing needs against sources that are already stretched, a government is left with no option but to secure additional sources or draw down its international reserves. The problem is that financing sources tend to get scarce in the face of repayment difficulties and foreign reserves burn through quickly once confidence in an economy and its currency are eroding.

Such was the case of Sri Lanka in the second half of 2021 and the first quarter of 2022, until the government had to yield eventually and declare default. The near depletion of foreign reserves led to the suspension of amortization payments of about \$6 billion on external debt in April 2022, shown as a dotted bar in **Figure 18**. This reduced the country's financing needs that year by an equivalent amount. Meanwhile, loan disbursements to the country were just sufficient to cover for repayments to the IMF and the other international financial institutions (IFIs), as well as for the current account deficit though the shortage of foreign currency had curtailed it significantly. In September 2022, the IMF staff agreed to a 4-year \$2.9 billion External Fund Facility package, for approval by its board and pending progress with securing debt relief and broader creditor support, including private lenders (IMF 2022a). Assuming this will push through, in 2023, the sources of financing would be expected to include a first tranche of IMF financing to the amount of \$725 million, plus \$2.7 billion disbursements from other official creditors, and another \$385 million from net capital inflows. To cover for the current account deficit, which is expected to shrink to \$800 million as the economy keeps suffering from the ongoing crisis, as well as for scheduled payments to the IMF (\$187 million) and other IFIs (\$440 million), about half of the estimated \$4.8 billion of principal payments falling due in 2023 to other creditors would have to be rescheduled or dealt with otherwise as part of the ongoing relief negotiations. Any relief beyond minimum coverage of the projected financing gap would further allow the country to relax the stranglehold on its external accounts and help rebuild foreign reserves from its recent \$1.9 billion trough (as of December 2022). Anything less would possibly entail the country defaulting on its debt obligations more broadly, or imports would have to be curtailed further.

Pakistan's balance of payments difficulties and funding challenges are portrayed in **Figure 19**, comparing financing sources and needs by fiscal year up to 2024. Faced with a funding gap equal to \$7.5 billion in fiscal year (FY) 2021/22 that needed closure, the country had to run down foreign reserves by \$7.5 billion. About half of its economy's funding needs had arisen from a current account deficit, while the rest of it went as amortization payments to public (\$11.3 billion) and private (\$4.5 billion) creditors, and to IMF repurchases (\$1 billion). Meanwhile, available financing sources comprised \$20.8 billion of official and private creditors' disbursements and, crucially, an \$1.1 billion IMF disbursement (or bail out) as part of its EFF program plus \$2.7 billion as a special SDR allocation.

For the subsequent fiscal years, the IMF's 7th and 8th EFF Review of September 2022 expected a shrinking current account deficit to ease financing needs, while additional EFF tranche payments and rollovers by both official and private creditors would more than fill the financing gap from large loan repayments falling due. In FY2022/23, a buildup of international reserves by \$6.4 billion was initially expected. However, devastating floods later that year came as an additional shock to Pakistan's economy

**Figure 18: Sri Lanka's External Funding Gap**

bn = billion, EFF = Extended Fund Facility, FDI = foreign direct investment, GDP = gross domestic product, IFI = international financial institution, IMF = International Monetary Fund.

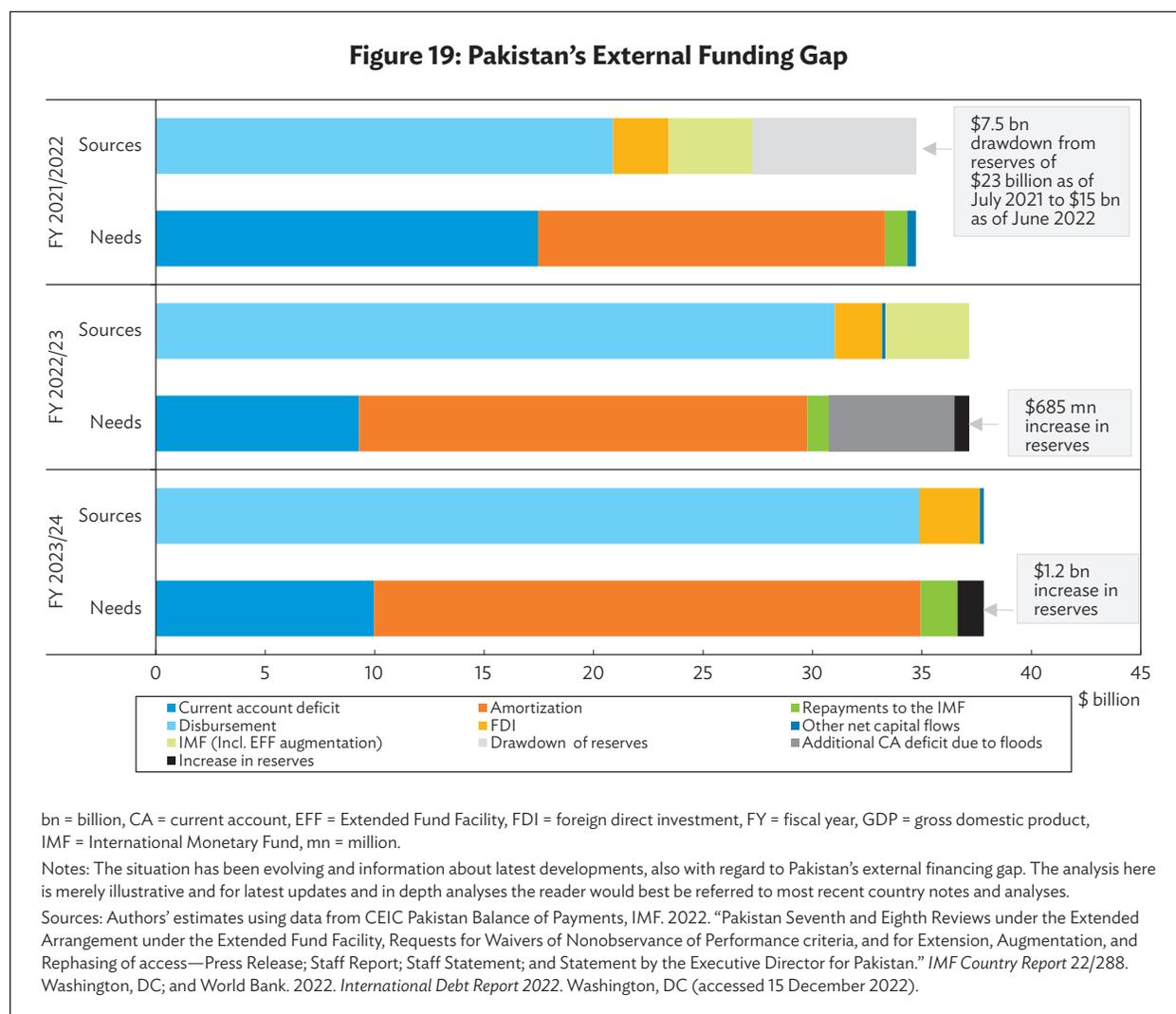
Notes: On 12 April 2022, the Government of Sri Lanka announced temporary suspension of repayments of its external debt, including bonds and bilateral loans. Repayments to the IMF, World Bank, and Asian Development Bank continue. The situation has been evolving and information about latest developments, also with regard to Sri Lanka's external financing gap. The analysis here is merely illustrative and for latest updates and in depth analyses the reader would best be referred to most recent country notes and analyses.

Sources: Author's estimates based on CEIC Sri Lanka Balance of Payments data, IMF, 2021. "Sri Lanka 2021 Article IV Consultation—Press Release; Staff Report; and Statement of the Executive Director for Sri Lanka." *IMF Country Report 22/91*. Washington, DC; World Bank, 2022. *International Debt Report 2022*. Washington, DC (accessed 15 December 2022); Outlook India, 2022. "India Emerges As Sri Lanka's Biggest Lender In 2022, Gives \$376.9 Million To Rescue Crisis-Hit Country." 18 July. <https://www.outlookindia.com/international/india-emerges-as-sri-lanka-s-biggest-lender-in-2022-gives-376-9-million-to-rescue-crisis-hit-country-news-210129>; and Economynext, 2022. "Sri Lanka continuing payments to multilateral creditors." 3 August. <https://economynext.com/sri-lanka-continuing-payments-to-multilateral-creditors-minister-98920/>.

and public finances. Their impact on the FY2022/23 current account deficit alone has been estimated at \$5.7 billion, reducing to a mere \$685 million the country's prospects for replenishing its foreign reserves during that year. In FY2023/24, net external funding is expected to allow for a marginally higher buildup of reserves, amounting to \$1.2 billion.

With foreign reserves running low and large amortization payments falling due, Pakistan's public finances remain uncomfortably dependent on a lifeline made of continuing positive net disbursements and rollovers, not only from key multilateral and bilateral development partners, but also from private creditors. During FY2022/23 and FY2023/24, the need for disbursements by official lenders is estimated at \$27 billion, while commercial lenders would have to lend \$39 billion for Pakistan's external financing gap to close. The Government of Pakistan was reported having requested the PRC to roll over \$6.3 billion of debt outstanding and maturing within the first half of 2023 alone, and having explored the rescheduling of even larger amounts of debt outstanding.<sup>17</sup> By December 2022, with uncertainty about the actual funding availability running high and the country's foreign reserves down to \$6.7 billion, equivalent to

<sup>17</sup> See Lawder and Do Rosario (2022) "Pakistan seeks to reschedule \$27 billion bilateral debt." and Rana (2022) Pakistan seeks \$6.3b China debt rollover ([tribune.com.pk](http://tribune.com.pk)).

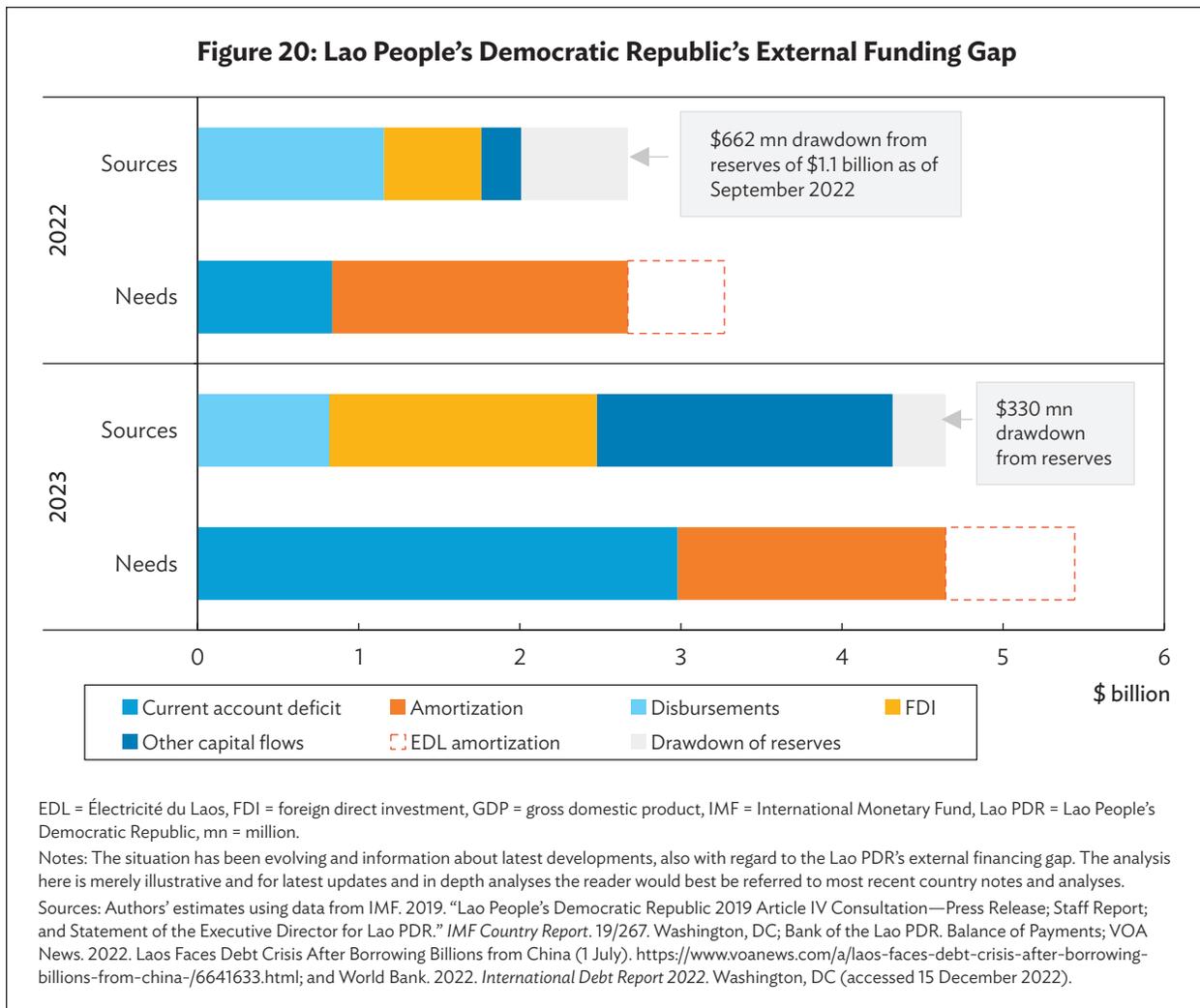


only a month worth of imports, the government resorted to the rationing of gas in the midst of winter in an attempt to cut back on its imports bills until the liquidity crunch will have eased.

The Lao PDR's external funding needs for 2022 are estimated at \$2.7 billion (17% of GDP), of which more than 70% is for hefty amortization payments—more than \$1 billion in amortization are scheduled annually through to 2025 (**Figure 20**). While planned FDI of \$0.6 billion and disbursements of \$1.2 billion constitute a significant source of external financing, the remaining external funding needs in 2022 worth \$662 million (4% of GDP) would have to be financed by further drawdowns from international reserves, which had already dwindled to \$1.1 billion by September 2022.

Rising FDI and other capital net inflows are expected to expand the Lao PDR's financing sources in 2023, insufficient though to cover for the burgeoning current account deficit and debt repayment. We estimate that the country will face a financing gap of \$330 million in 2023, which would have to result in further drawdowns of already meager foreign reserves, lest additional net disbursements or some form of debt relief would be forthcoming as the Government of the Lao PDR negotiates with its main bilateral creditors, foremost being the PRC.

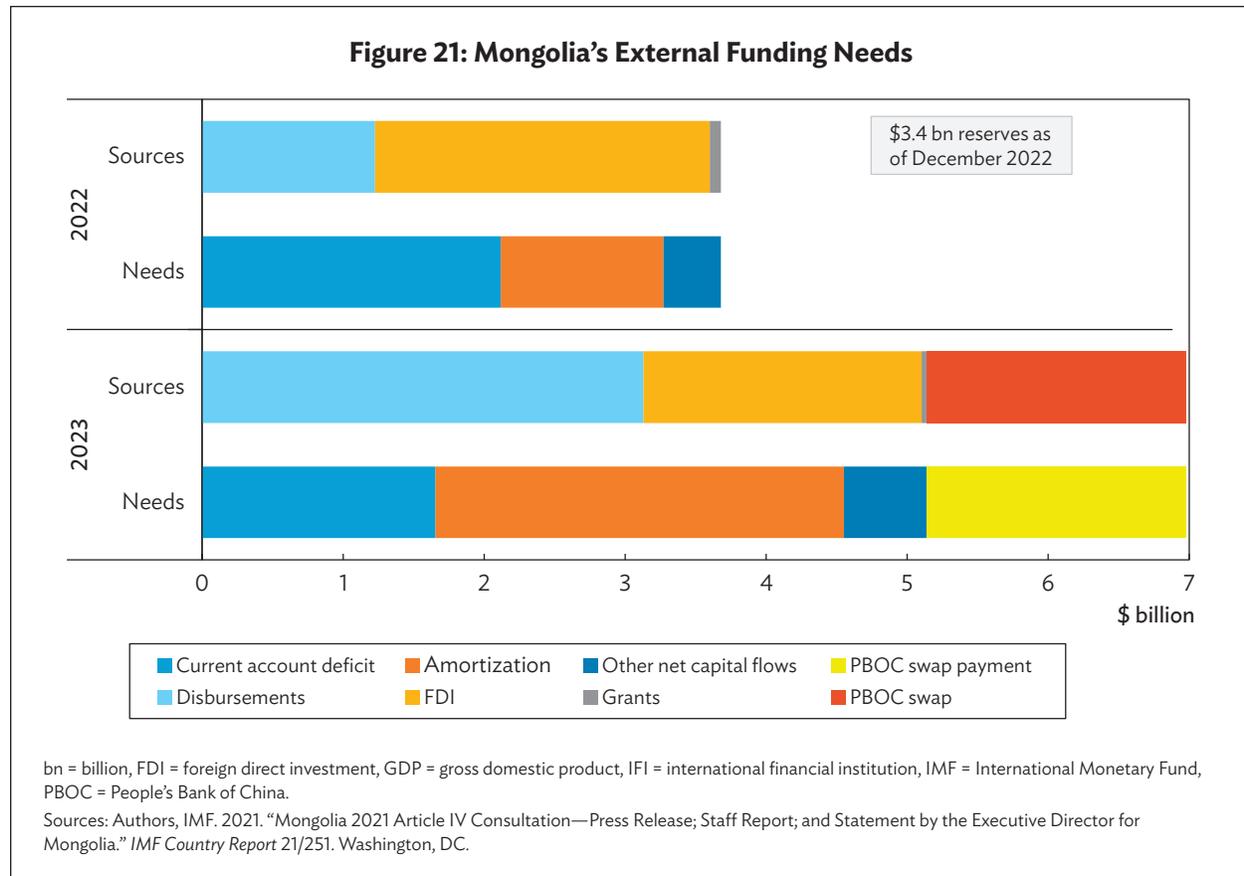
Furthermore, the Lao PDR's external funding sources would also have to cover for the annual external obligations of Électricité Du Laos (EDL), the state-owned power company. These liabilities are



estimated at around \$600 million in 2022 and \$800 million by 2023, shown by dotted bars in Figure 20 (AMRO 2020). To meet these needs, the government hopes to be mobilizing revenue sources such as through a one-off EDL power transmission line leasing fee, levies raised on the Lao PDR-PRC railway and dry ports, as well as fast-tracking the approval of pipeline mining projects.

Turning to the case of Mongolia, **Figure 21** breaks down the economy's 2022 external funding needs to \$3.7 billion (24% of GDP), of which \$2.1 billion is for its current account deficit, \$1.2 billion for amortization, and \$400 million for capital outflows. This stands vis-à-vis available financing sources worth \$2.4 billion of FDI, \$1.2 billion of loan disbursements, and \$79 million of grants. Foreign-currency reserves stood at \$3.4 billion by the end of 2022. Mongolia faces a sharp rise in financing needs in 2023 from increasing amortization flows plus the repayment of a swap with People's Bank of China (PBOC). To close the gap, the Government of Mongolia has managed to secure official development assistance from the IFIs and bilateral partners amounting to \$3.3 billion, as well as, crucially, the renewal of the PBOC swap worth \$1.8 billion for 2023. Reserves are expected to remain largely unchanged next year, as long as the external financing needs and sources will pan out as planned.

In sum, our analysis of external financing gaps reinforces an impression that the funding situation remains highly precarious among the high-risk countries in the region. Not only is official development



assistance disbursement backstopping crucial to providing a lifeline for these countries to weather continuing challenges, but so is the PRC's willingness to extend its financial support and rescheduling where necessary to countries that have grown increasingly reliant on it. Much will have to depend on the continued flow of external financing amid creditors' mounting concerns about their ability or not to coordinate amid a growing need for concerted relief. The possibility of outright default in the near term by one country or the other and beyond those included in this analysis certainly cannot be ruled out and should be monitored closely and coordinated upon preemptively to the extent possible.

## B. Near-Term Debt Distress Ratings—Multivariate Logit Estimates

A recurrent and unsurprising finding throughout the preceding analysis is that debt distress tends to be observed especially in countries that have been known to struggle for long, mainly because of deeply rooted structural and institutional challenges. A new rating tool the IMF rolled out in 2022 as part of its Sovereign Risk and Debt Sustainability Framework is designed to pick up on such enduring challenges and their implications in terms of heightened near-term risk. Although the new framework has yet to be operationalized more fully, we test its applicability within the context of ADB members that the IMF classifies as "market-access countries" (MAC) for its ability to predict stress in line with the vulnerabilities identified by the heat map analysis. Essentially, we apply the IMF's coefficient estimates in relation to the stress predictors identified by the multivariate logit model and which we compute for ADB's MAC. The methodology is described in **Box 3** and involves our determination of each economy's past stress episodes, as well as the compilation of a data set on institutional quality, real effective exchange rate depreciation, and a number of other indicators along the specification of the logit model. Data availability across all the stress precursors allows for the computation of sovereign stress ratings for 18 economies in our regional sample.

### Box 3: International Monetary Fund's Logistic Risk Assessment for Market-Access Economies

The International Monetary Fund's (IMF's) Sovereign Risk and Debt Sustainability Framework for Market-Access Countries adopts a standard probabilistic framework for near-term risk analysis. Specified by a multivariate logistic (logit) regression, the tool determines an economy's stress probability as the odds of experiencing a sovereign debt-related stress within the next 2 years. The IMF specifies the model along nine predictors that are organized in five categories: (i) institutional quality, (ii) stress history, (iii) cyclical, (iv) debt burden and buffers, and (v) global. The model is fitted to a panel comprising 1,579 observations across market-access economies and 29 years up to 2018 (table below). Risk ratings of low, moderate, or high are determined against score thresholds, calibrated to entail a 10% missed crisis probability by the low-to-moderate threshold (0.09) and a 10% false alarm probability by the moderate-to-high threshold (20.5).

To compute risk ratings for each of the 18 economies in our sample, we use the IMF's estimated coefficients in conjunction with the realized values of each

predictor, drawing mainly from the ASDM database as well as additional sources such as the World Bank's Worldwide Governance Indicators. We compile economies' stress history based on a large number of sources and according to the IMF's six criteria of stress episodes, relating to an economy; (i) necessitating emergency support by the IMF or other IFIs and donors; (ii) defaulting on its external or domestic debt; (iii) undergoing debt restructuring; (iv) experiencing high chronic inflation; (v) facing high lending rates and spreads; and (vi) practicing financial repression. The stress history variable is generated by a unit impulse in the first year of stress, which then decays geometrically with an AR-coefficient of 0.9. Its impact on an economy's stress score lessens by 10% each year and will have faded completely for any episode that happened more than 10 years prior.

We thus compute the economies' ratings based on the latest information available, in reference to 2022, as well as for 2018 and 2020, for a comparison of scores over time. The ratings are shown in Table 4.

**Risk Indexes and Estimated Coefficients of the International Monetary Fund Multivariate Logit Model**

Response Variable: Debt-Related Stress Indicator			
Category	Predictors	Description	Estimated Coefficient
<b>Institutional Quality</b>		Structural characteristics, determining an economy's debt carrying capacity	-1.073 ***
<b>Stress History</b>			0.514 ***
<b>Cyclical</b>	Current account balance/GDP	Economy-specific buildup of vulnerabilities through the external position, the financial sector, and/or a weakening of the fiscal position	-0.024 **
	REER (3-year change)		0.013 **
	Credit/GDP gap (t-1)		0.086 ***
<b>Debt Burden and Buffers</b>	$\Delta$ (Public debt/GDP)	Vulnerabilities associated with the level, dynamics, and structure of debt, and with the risk-mitigating role of reserves and liquid assets	0.052 ***
	Public debt/revenue		0.002 ***
	FX public debt/GDP		0.024 ***
	International reserves/GDP		-0.034 ***
<b>Global</b>	$\Delta$ VIX	Economies exposed to international markets are more likely to suffer a crisis when global financial conditions deteriorate	0.015 ***
<b>Cutoff Scores</b>			
	Rating	Probability Score	
	Low	$x < 0.09$	
	Moderate	$0.09 < x < 20.5$	
	High	$20.5 < x$	

$\Delta$  = change, FX = foreign currency, GDP = gross domestic product, REER = real effective exchange rate, t-1 = lagged-one or previous period; VIX = volatility index.

Note: Stars indicate statistical significance of the coefficients at the 1 percent (\*\*\*) and 5 percent (\*\*) levels.

Source: IMF. 2021. "Review of the Debt Sustainability Framework for Market Access Countries." *IMF Policy Paper* 2021/003. Washington, DC.

Sources: Authors; IMF. 2021. "Review of the Debt Sustainability Framework for Market Access Countries." *IMF Policy Paper* 2021/003. Washington, DC; IMF. 2022. Staff Guidance Note on the Sovereign Risk and Debt Sustainability Framework for Market Access Countries. IMF Policy Paper No. 2022/039. Washington, DC. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2022/08/08/Staff-Guidance-Note-on-the-Sovereign-Risk-and-Debt-Sustainability-Framework-for-Market-521884>.

According to the risk rating tool's logit estimates, an economy's institutional quality and distress history is ascribed the highest predictive power of it experiencing distress again, within the next 2 years. It comes as no surprise then that our results, shown in **Table 6**, should assign to both Pakistan and Sri Lanka a high-risk rating, given their long history of stress and IMF bailouts. In addition, both countries score low on account of poor institutional quality, high and rising public debt ratios, and shrinking foreign reserves. For Sri Lanka, less so Pakistan, a further aggravating factor would be, of course, that a high share of public debt is denominated in foreign currency.

**Table 6: Near-Term Sovereign Stress Ratings**

	Sovereign Stress Rating		
	2018	2020	2022
Armenia	High	Moderate	Moderate
Azerbaijan	Moderate	Moderate	Moderate
PRC	Low	Low	Low
Fiji	Low	Low	Low
Georgia	Low	Low	Low
Hong Kong, China	Low	Low	Low
Indonesia	Low	Low	Low
India	Low	Low	Low
Kazakhstan	Low	Low	Low
Mongolia	Moderate	Moderate	Moderate
Malaysia	Low	Low	Low
Pakistan	High	High	High
Philippines	Low	Low	Low
Republic of Korea	Low	Low	Low
Singapore	Low	Low	Low
Sri Lanka	High	High	High
Thailand	Low	Low	Low
Viet Nam	High	Moderate	Moderate

PRC = People's Republic of China.

Sources: Authors' calculations using data from Asian Development Bank Sovereign Debt Monitor database; Bloomberg; Bruegel; Federal Reserve Bank of St. Louis; International Monetary Fund. 2021. "Review of the Debt Sustainability Framework for Market Access Countries." *IMF Policy Paper* 2021/003. Washington, DC; International Monetary Fund's International Financial Statistics; and World Bank's World Development Indicators.

While no other economy in our sample gets a high-risk rating assigned in 2022, Armenia, Azerbaijan, Mongolia, and Viet Nam are categorized as "moderate risk." For the case of Armenia, this is reflective mostly of the country's stress history.<sup>18</sup> For Azerbaijan, Mongolia, and Viet Nam, poor government effectiveness and low regulatory quality are the main drivers behind the rating. For both Viet Nam and Armenia, ratings improved after 2020, from "high" to "moderate," which is reflective of a gradually dissipating impact of past distress episodes in terms of the odds of that country running into further

<sup>18</sup> The IMF identified 2014 to 2016 as stress years for Armenia given that the government requested a 38-month IMF-supported program (for 89% of quota), with one of the objectives "to consolidate stability and buffers against possible external shocks" (IMF Country Report No. 14/89). Moreover, the country also received a financing from the Eurasian Fund for Stabilization and Development during the same period.

trouble. For example, Viet Nam's most recently experienced distress is in 2010 and ceases to impact its logit stress ratings after 10 years, from 2020 onward. Besides, the country's rating also improved on account of having increased its foreign reserves buffers. By contrast, Armenia experienced distress as recently as 2014 and 2016, which continues to affect its scores, but this gets tempered by improving institutional quality, higher foreign reserves, and declining public-debt-to-GDP. None of the other economies included in the sample shows any signs of near-term risks in the period 2018, 2020, and 2022, according to the model predictors.

## VI. CONCLUSIONS

A globally darkening horizon hampers growth and tightens financial conditions just when ailing economies and public finances hoped to be exiting the long pandemic lockdowns under more favorable conditions and a vigorous global rebound. Even in Asia and the Pacific, the macroeconomic and fiscal outlook has generally been worsening, although ADO and WEO remain largely sanguine about the region's growth prospects and its economies' ability to recover. This translates, still, into public debt ratios that would appear to be stabilizing over the medium term, although at significantly high levels by historic standards and not uniformly so across the region. Even where ratios seem to be somewhat in check, growing costs and difficulty of refinancing debt amid quantitative tightening constitutes an increasing drain on vital fiscal resources at a time when economies are reeling from the pandemic and struggling to maintain or rebuild at least some space for further fiscal support, lest long-term development goals will have to suffer.

Of some concern are the emerging markets with high external debt or large net foreign liabilities positions, especially if capital flow reversals were to manifest and panicky investors rushed to exit across their foreign market portfolios. Such heightened outflows, but no signs of panic were witnessed throughout the first three quarters of 2022 and are likely to intensify again if interest rate differentials and country risk premiums grew larger or exchange rate volatility and pressures further mounted in parts of the region. Risks in some of these markets get compounded by highly leveraged households and nonfinancial corporates, which are massive contingent liabilities to host governments against a backdrop of tightening global and local financial conditions, slowing growth, job losses, and shrinking demand.

Some observers seem to have grown increasingly wary also in relation to the recipients of highly concessional official finance, many of whom have long been deemed at a high risk of distress. However, grants and other official development assistance through the International Development Association, the Asian Development Fund, and bilateral aid mechanisms are fairly well configured to readily modulate to economies' changing vicissitudes and entails magnitudes of support that usually can be absorbed by developing partners' aid envelope overall, assuming donors' readiness for steady replenishments. In such a context then, grounds for concern arise mostly in relation to recipient economies that are comparably large in terms of donors' aid envelopes or whose vital official support gets cut off or suspended for reasons geopolitical or of internal strife.

Of major concern are situations of unresolved default or longstanding distress in the region, which are relatively few at this time of writing, but may increase in the months and years to come. Foremost is Sri Lanka, which finds itself stuck in a slow-moving and lengthy process of debt rescheduling negotiations that are mired in complexity and lack a clear blueprint and global institutional mechanism that could bring about convergence among the G20 major creditors on the one hand and commercial lenders on the other, while also imparting a fair share of the burden on the holders of domestic debt. In Sri Lanka, as in other countries, struggling to stay current on external debt obligations, a major issue is,

of course, the emergence of the PRC as the largest bilateral official lender, which adds a whole layer of complexity to creditors finding common ground for negotiations. In addition, bondholders and other commercial creditors tend to hold substantial shares of debt outstanding, even among countries with relatively limited access to the financial markets. Getting all these creditors and their vastly differing incentives to converge on comparable terms of treatment is a truly herculean endeavor that has never really been achieved, even when the creditor mix was far less complex than today and centered mainly on the like-minded members of the Paris Club.<sup>19</sup>

Whether bracing for a long and difficult way out of distress or struggling to avoid succumbing to the challenges posed by tightening financing difficulties, governments should implement now reforms that are long overdue, especially toward rationalizing fiscal expenditure and dropping subsidy schemes when they are deleterious and distortive to their economies while achieving next to nothing in terms of targeting those in need. While there are few universal prescriptions for a group as diverse as Asia and the Pacific, full transparency about their debt and its management, and increased mobilization of domestic resources to the extent possible, should be a prerogative to all. Transparency should be embraced also by the all the bilateral official creditors, especially when undisclosed lending in various guises imperils debt sustainability, clouds outlook assessments, and hampers the prospects for creditor coordination. Finally, if there is to be a silver lining to this current crisis, too good to be wasted, the G20 would do well by seizing this opportunity and agree to the establishment of a sovereign debt restructuring mechanism as has long been envisaged and reflective of its members' roles and responsibilities in a changing world order.

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<sup>19</sup> Not to diminish the hugely important Heavily Indebted Poor Country (HIPC) and Multilateral Debt Relief Initiative (MDRI), which went far in terms of relief by the official creditors, but largely failed to enforce private creditor participation to any sufficient or acceptable extent.

## APPENDIX 1: HEAT MAPS

The following notes apply to all the tables on heat maps in this Appendix:

- (i) Economies are classified as lower-income or market-access based on the International Monetary Fund (IMF)–World Bank debt sustainability framework. For economies not covered by the framework, their classification is based on Asian Development Bank (ADB) grouping, such as Nauru classified as lower-income, and Brunei Darussalam; Taipei,China; and Turkmenistan classified as market-access.
- (ii) Group A consists of ADB members that are concessional assistance-only, and Group B consists of ADB members eligible for ordinary capital resources (OCR) blend. Group C are regular OCR only and those that have graduated from ADB assistance (which are Brunei Darussalam; Hong Kong, China; the Republic of Korea; Singapore; and Taipei,China).
- (iii) Missing data are reflected as blanks in the heat map tables.

Table A1.1: Heat Map – Headline Indicators, 2020–2021

Market-access Lower-income	PUBLIC		EXTERNAL						MACRO-FINANCIAL AND RATINGS						OTHER FACTORS							
	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021	2020-2021								
	% of GDP	% of GDP	% of GDP	PPG Long-term Debt	Short-term Debt (PPG and PNG)	PPG Debt Service	% of Exports	PPG Interest Payments	PPG Debt Service Owed to Commercial Creditors	% of PPG Debt Service	% of Exports	Exchange Rate	Inflation Rate (ADO)	% of Total Loans		Nonperforming Loans	Market Lending Rates	Scale (0 – 20)	Rating			
<b>GROUP A</b>																						
Bhutan	1317	0.6	-1.6	-0.8	9.1	4.3	1256	1228	1.8	0.1	10.3	4.0	7.3	55.7	14.0	6.0	Moderate	India hydro; FMX				
Cambodia	357	-4.3	4.7	1.8	5.7	2.0	729	354	20.7	15.9	1.9	0.5	7.3	64.6	10.6	6.0	Low	FMX				
Kiribati	182	-6.0	5.5	-2.5	13.4	0.2	182	182	0.0	0.0	0.0	0.0	0.0	37.9	1.8	6.0	High	SWF; RERE; FMX				
Kyrgyz Republic	64.4	-0.9	-3.1	-5.9	2.8	0.3	1088	479	47.1	6.5	6.0	1.7	0.0	0.0	10.8	16.8	Moderate	CTF; TF; FMX				
FSM	166	8.9	-8.5	2.2	0.8	0.8	154	154	0.0	0.0	0.0	0.0	0.0	2.0	0.2	14.4	High	FMX				
Lao PDR	88.1	-3.3	0.8	-3.2	9.6	9.6	93.4	565	31.1	5.1	9.8	2.5	55.4	21.3	10.9	2.0	High	FMX				
Maldives	139.6	-16.3	16.8	-0.5	22.8	9.6	83.2	65.0	2.9	11.3	16.9	3.1	25.2	76.3	11.6	3.0	High	FMX				
Marshall Islands	20.8	1.9	-2.6	-2.9	0.4	0.4	37.3	35.0	2.2	0.0	0.0	0.0	0.0	0.0	0.8	0.0	High	CTF; FMX				
Myanmar	50.8	-4.9	8.3	6.8	7.8	12.4	18.9	16.8	0.3	0.1	6.2	3.8	22.8	2.8	10.4	0.0	Low	FMX				
Nauru	44.1	39.9	-41.9	-3.3	0.2	0.2	17.7	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Low	TF; CD; FMX				
Nepal	44.1	-4.0	2.7	-3.2	5.6	3.1	24.1	21.3	0.4	1.0	12.5	2.8	0.0	137.0	1.4	9.7	Low	FMX				
Samoa	50.9	4.0	-1.2	5.5	3.9	1.1	51.4	45.2	0.0	0.0	16.5	3.0	0.0	106.9	3.7	8.6	High	FMX				
Solomon Islands	15.1	-3.2	3.4	2.5	3.9	0.6	28.8	8.4	14.9	2.5	1.5	0.3	23.5	23.5	10.8	10.5	Moderate	FMX				
Tajikistan	47.4	-1.6	-2.6	-9.2	10.1	3.5	83.0	37.4	28.5	12.0	11.5	4.0	5.5	66.4	6.3	8.7	High	FMX				
Tonga	45.5	2.6	-0.4	5.1	0.8	0.8	43.6	38.7	0.0	0.0	6.0	1.3	0.0	33.9	3.6	7.8	High	FMX				
Tuvalu	67	7.2	-7.0	1.7	0.4	0.4	50	50	0.0	0.0	0.0	0.0	0.0	24.7	-6.2	4.2	High	TF; SF; FMX				
Vanuatu	479	1.1	0.4	3.1	2.0	2.0	50.9	41.7	0.0	4.1	13.3	3.9	0.0	23.0	3.2	0.9	Moderate	CD; FMX				
<b>GROUP B</b>																						
Bangladesh	34.9	-2.3	1.4	-2.9	5.3	21.5	20.8	14.8	1.7	3.6	5.4	1.9	6.2	54.8	7.8	4.3	8.0	Low	OF; FMX			
Fiji	77.5	-7.6	19.9	19.3	16.5	16.5	40.6	24.2	11.9	0.8	11.4	1.4	38.9	63.5	7.3	6.1	7.8	Moderate	SWF; PPP loans			
India	86.7	-6.2	4.6	-1.9	13.3	26.8	20.2	6.8	9.2	3.7	3.9	0.4	22.1	28.3	5.4	4.4	11.0	Moderate	SWF; PPP loans			
Mongolia	88.6	-3.7	-0.2	-3.8	16.4	8.3	232.6	80.0	140.8	8.7	14.3	3.6	36.6	56.5	8.9	15.5	5.7	Moderate	SWF; PPP loans			
Pakistan	77.2	-1.3	-2.4	-4.9	9.5	40.6	43.9	32.2	5.3	2.9	26.5	5.6	40.7	68.1	2.2	1.2	9.8	High	SWF; PPP loans			
Papua New Guinea	49.0	-5.1	4.9	-0.2	17.0	17.0	67.6	21.4	42.1	1.3	7.2	1.1	25.6	-28.0	22.6	-3.4	6.0	High	SWF; PPP loans			
Palau	73.9	-12.3	23.0	13.0	0.0	2.2	71.8	71.8	1.6	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0	High	CTF; FMX			
Timor-Leste	13.9	-34.2	34.5	1.9	0.3	0.3	12.0	10.7	0.0	0.0	16.5	6.8	0.0	33.5	-2.8	-7.5	2.2	Moderate	SWF; FMX			
Uzbekistan	36.7	-3.5	-1.1	-14.4	7.0	1.7	55.2	29.0	19.9	4.6	6.5	2.0	4.4	63.8	-6.0	11.8	8.3	Low	SWF			
<b>GROUP C and Others</b>																						
Armenia	61.9	-2.4	2.8	1.3	9.0	10.6	99.4	44.7	37.7	11.8	10.4	3.7	6.2	85.6	3.2	11.7	7.5	Moderate	SWF; FMX			
Azerbaijan	23.9	-0.5	0.1	-1.5	3.7	2.2	31.9	28.3	2.1	0.5	7.6	2.3	27.9	-6.7	4.8	13.9	9.7	Moderate	SWF; FMX			
Brunei Darussalam	2.7	-11.9	11.9	-0.4	0.0	0.0	15.4	2.6	4.4	8.2	1.3	0.4	14.7	-1.1	1.8	3.6	5.5	Moderate	MF; HH; NFC			
PRC	69.8	-7.0	3.4	-5.8	13.6	3.6	122.4	49.4	53.7	13.7	15.2	0.4	14.7	40.4	-2.9	1.9	4.9	16.0	Moderate	FMX; HH; NFC, FC		
Georgia	54.8	-6.2	2.2	-7.0	13.6	5.7	510.3	0.7	96.9	355.9	0.0	1.8	27.6	89.9	-11.1	7.4	2.1	12.2	9.0	Moderate	SWF	
Hong Kong, China	1.2	-4.6	4.6	-0.4	0.0	0.0	12.4	2.6	4.4	8.2	1.3	0.4	14.7	40.4	0.7	7.4	2.1	12.2	9.0	Moderate	SWF	
Indonesia	40.5	-3.3	4.0	2.5	6.3	15.6	37.2	21.9	10.6	4.1	15.5	4.2	38.3	50.2	1.5	1.0	0.9	17.7	Moderate	SWF		
Kazakhstan	25.7	-4.8	3.8	-3.6	13.5	7.1	87.7	14.2	66.7	6.2	3.1	1.7	2.7	76.0	-3.4	0.6	7.4	5.1	13.6	Moderate	SWF	
Malaysia	68.4	-3.1	4.2	2.0	5.6	10.0	70.0	16.5	25.8	26.5	0.0	1.7	2.7	17.0	0.7	3.2	3.8	5.7	12.5	Low	SWF; HH; NFC	
Philippines	54.3	-4.2	5.8	4.1	10.9	9.1	27.1	15.3	7.3	3.9	7.9	2.6	46.1	23.5	0.7	-1.8	3.2	3.8	5.7	Low	SWF; HH; NFC	
Republic of Korea	50.0	-0.1	-0.6	-1.4	4.1	4.1	34.2	9.7	15.1	9.4	0.0	0.0	0.0	0.0	-0.3	1.5	0.5	2.8	17.7	Low	SWF; FMX; FIN; NFC, FC	
Singapore	158.4	0.6	0.2	0.9	0.0	22.6	460.8	0.0	150.4	310.2	0.0	0.0	0.0	0.0	17.5	1.1	5.3	20.0	0.0	High	NFC	
Sri Lanka	99.4	-5.8	7.0	1.6	16.7	71.5	64.8	42.3	10.1	9.8	31.8	10.6	51.8	96.5	-1.3	2.6	4.7	10.9	3.0	High	NFC	
Taipei, China	30.5	-0.1	-0.5	-1.0	3.8	12.1	28.0	0.2	2.0	25.8	0.0	0.0	0.0	0.0	13.8	-4.3	0.9	0.2	2.5	9.0	High	SWF; FMX
Thailand	54.0	-5.2	6.7	3.4	25.3	3.1	40.9	7.1	18.2	14.8	1.3	0.2	15.4	31.4	1.0	3.9	0.2	3.2	13.0	High	SWF; FMX	
Turkmenistan	12.1	-0.5	-0.7	-9.0	1.7	-1.5	9.2	8.5	0.1	0.1	18.0	2.1	7.3	-6.7	4.2	-4.5	11.3	3.2	7.0	High	FMX	
Viet Nam	40.7	-1.9	1.2	-1.7	6.9	6.9	36.8	14.2	13.8	8.4	1.4	0.3	6.8	12.5	1.7	-0.2	2.5	7.7	8.8	Low	FMX; NFC	

ADO = Asian Development Outlook; CD = cash deposits; CTF = Compact Trust Fund; DOD = debt outstanding; EDD = external debt outstanding; EMBI = Emerging Market Bonds Index; EFN = external financing needs; FC = financial corporate debt; FIN = financial center; FMX = fixed or managed exchange rate; FSM = Federated States of Micronesia; FX = foreign reserves; GDP = gross domestic product; HH = household debt; Irg = interest-growth; NFC = nonfinancial corporate debt; OF = other funds; PDDOD = public debt outstanding; PNG = private nonfinancial debt; PP = percentage point; PPG = public and publicly guaranteed; PPP = public-private partnership; PRC = People's Republic of China; SWF = sovereign wealth funds; TF = trust funds.  
Sources: Authors' calculations using Asia Sovereign Debt Monitor Database, Asian Development Bank's Asian Development Outlook Supplement (December 2022), CEIC, Bloomberg International Monetary Fund's World Economic Outlook (October 2022), S&P, Sovereign Wealth Fund Institute, World Bank's International Debt Report 2022, World Development Indicators.





Table A1.4: Heat Map – Public Debt, 2018–2019

Market-access Lower-income	STRUCTURE			DEBT DYNAMICS			OTHER INDICATORS																																	
	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019	2018–2019																						
	% of GDP	Public Debt minus Threshold (Breach)	% of Public Debt in Foreign Currency	Public Debt Held by Nonresidents	Change in Debt	Due to Primary Deficit	Due to Interest Rate	Due to Growth Rate	Due to Exchange Rate	Due to Other Factors	Fiscal Balance	% of GDP	Fiscal Revenues	% of GDP	Fiscal Expenditures	% of GDP	Interest Payments	Ave. on PDOOD	Primary Fiscal Balance	% of GDP	Primary Gap Indicator	% of GDP	I-g Differential	Gross Financing	% of Revenues	Public Debt Service	% of Revenues	Interest Payments	% of Revenues	Amortization	% of Revenues									
<b>GROUP A</b>																																								
Bhutan	109.9	74.9	95.5	93.7	-2.6	0.7	-1.3	-4.4	5.6	-3.2	-1.9	28.1	30.0	1.2	1.1	-0.7	-5.0	-5.3	-1.0	4.4	4.2	3.1	0.6	15.7	18.6	2.9	0.3	7.8	6.0	0.3	13.4	13.4	0.2	6.4	6.7	2.1	2.3	4.6		
Cambodia	28.3	-41.7	100.0	100.0	-0.9	-2.1	-0.6	-1.9	0.1	3.6	-0.6	25.2	23.4	0.3	1.3	2.1	-4.6	-9.1	-1.0	4.4	1.4	3.1	0.6	15.7	18.6	2.9	0.3	7.8	6.0	0.3	13.4	13.4	0.2	6.4	6.7	2.1	2.3	4.6		
Kiribati	19.8	-35.2	100.0	106.6	-0.6	-7.6	0.3	-0.5	1.1	6.1	0.3	142.2	134.8	0.3	1.3	7.6	-7.8	-0.8	-0.8	0.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Kyrgyz Republic	53.2	-16.8	84.8	87.4	-3.6	-0.6	-1.2	-2.1	0.3	0.0	-0.3	32.5	32.8	1.0	1.8	0.6	-3.9	-6.0	5.4	18.6	2.9	15.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
FSM	18.7	-16.3	94.8	94.8	-2.0	-18.8	-0.9	-0.1	0.0	17.8	0.0	76.2	54.9	0.2	1.2	18.8	-19.9	-5.0	-5.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Lao PDR	60.8	25.8	89.4	89.4	2.4	2.8	0.0	-3.0	2.0	0.6	0.0	15.8	19.8	1.2	2.3	-2.8	-0.2	-5.4	6.0	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Maldives	75.4	40.4	49.7	33.8	7.1	4.3	1.0	-4.7	0.0	6.5	0.0	27.1	33.1	1.6	2.6	-4.3	0.7	-5.9	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Marshall Islands	24.7	-10.3	93.2	93.2	-0.2	-0.8	0.7	-1.8	0.0	1.6	0.0	62.7	62.4	0.3	1.1	0.8	-1.8	-4.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Myanmar	39.6	-15.4	25.7	25.7	0.1	2.0	-0.6	-2.3	0.3	0.6	-2.3	17.0	20.6	1.6	4.7	-2.0	-0.8	-7.7	4.3	13.4	9.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Nauru	68.8	-1.2	46.9	46.9	-7.6	-26.8	-2.4	-2.4	1.7	22.1	0.0	138.8	107.1	0.3	0.4	26.8	-31.5	-6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Nepal	31.6	-38.4	56.9	54.9	-4.1	-4.9	-0.7	-1.7	0.7	0.9	-0.7	22.3	27.7	0.5	1.9	-4.9	2.5	-9.7	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Samoa	48.5	-21.5	95.1	95.1	-1.2	-1.5	0.1	-0.9	1.1	0.1	0.0	31.6	30.9	0.7	1.5	1.5	-2.3	-1.7	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Solomon Islands	8.0	-47.0	75.1	75.1	-0.3	-0.1	0.1	-0.2	0.1	-0.2	0.1	35.7	36.1	0.5	6.1	0.1	-0.2	0.7	0.8	2.7	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Tajikistan	44.7	-10.3	85.4	85.4	-2.3	1.4	-0.4	-3.2	1.8	-1.9	0.0	27.5	29.9	1.0	2.3	-1.4	-2.2	-8.3	7.3	21.3	3.5	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Tonga	43.6	-26.4	87.5	87.5	-1.7	-3.9	-1.8	-0.2	0.7	3.6	0.0	42.1	39.1	0.9	2.1	3.9	-6.0	-4.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Tuvalu	12.0	-23.0	76.0	76.5	-0.2	-12.2	-0.1	-0.8	0.6	12.4	0.0	134.7	119.7	0.7	6.2	12.2	-13.2	-8.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Vanuatu	45.2	-9.8	87.6	84.4	-3.8	-5.4	-0.6	-1.4	1.2	2.5	0.0	41.1	36.5	0.9	2.0	5.4	-7.5	-4.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
<b>GROUP B</b>																																								
Bangladesh	30.6	-39.4	39.1	39.1	1.5	3.1	0.3	-2.0	0.1	-0.1	0.0	8.5	13.3	1.6	6.4	-3.1	1.5	-6.0	5.5	40.3	19.4	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	
Fiji	46.6	-23.4	30.1	30.1	3.1	1.3	1.8	-0.6	0.3	0.3	0.0	27.0	30.9	2.6	6.2	-1.3	2.5	2.7	6.0	40.3	19.4	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	
India	72.8	2.8	3.2	7.1	2.7	2.2	2.6	-3.3	0.1	1.0	0.0	19.9	26.9	4.7	7.3	-2.2	1.5	-1.1	8.1	29.7	23.6	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	
Mongolia	85.0	15.0	76.4	76.4	-11.8	-4.7	-5.2	-5.6	3.5	0.1	0.0	31.5	29.6	2.7	3.3	4.7	-15.4	-1.9	9.6	45.4	8.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	
Pakistan	71.2	1.2	34.7	37.1	8.3	2.4	0.7	-2.6	3.3	4.5	0.0	12.3	19.1	4.3	7.6	-2.4	0.5	-3.2	8.4	49.6	35.4	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1		
Papua New Guinea	38.4	-16.6	43.4	43.4	3.8	1.1	0.8	-0.7	0.3	2.4	0.0	17.0	20.5	2.4	7.6	-1.1	1.1	0.1	8.4	96.3	14.4	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7	80.7		
Palau	86.2	16.2	36.8	36.8	3.8	-3.9	2.2	-0.2	0.0	5.8	0.0	43.6	40.6	0.9	1.1	3.9	-1.9	2.4	2.4	5.4	2.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	
Timor-Leste	10.2	-24.8	105.9	105.9	2.4	28.2	0.0	-0.1	0.0	-25.8	0.0	54.6	83.0	0.2	2.0	-28.2	28.1	-0.7	1.5	9.7	1.2	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	
Uzbekistan	24.0	-46.0	68.9	68.9	4.5	-1.2	-3.2	-0.8	0.9	8.8	0.0	26.9	26.1	0.3	2.2	1.2	-5.2	-22.0	1.5	9.7	1.2	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5		
<b>GROUP C and Others</b>																																								
Armenia	50.7	-19.3	77.9	86.5	-1.8	-1.0	1.4	-3.1	-0.2	1.1	0.0	23.1	24.5	2.4	4.9	1.0	-2.7	-3.5	4.5	23.5	10.2	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3		
Azerbaijan	18.2	-51.8	93.4	91.0	-2.4	-7.9	-0.5	-0.4	0.0	6.4	0.0	40.0	32.8	0.7	3.6	7.9	-8.8	-3.9	4.5	9.4	1.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7		
Brunei Darussalam	2.6	2.6	0.0	2.0	-0.1	6.6	-0.1	-0.1	0.0	-6.6	0.0	25.7	32.3	0.0	0.0	-6.6	6.5	-4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
PRC	55.5	-14.5	0.3	2.0	2.8	4.4	-0.6	-3.1	0.0	2.0	0.0	28.5	33.7	0.8	1.7	-4.4	0.7	-7.4	6.4	23.7	2.9	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2		
Georgia	39.7	-30.3	77.9	97.7	-0.1	0.1	-0.6	-1.8	1.5	1.2	0.0	26.7	28.1	1.2	3.4																									





## APPENDIX 2: INDICATORS AND THRESHOLDS

		Thresholds		
PUBLIC DEBT		Low	Moderate	High
Structure	Public Debt (% of GDP)	$x \leq 35$	$35 < x < 70$	$x \geq 70$
	Public Debt minus Threshold (Breach) (% of GDP)	$x \leq 0$	$0 < x < 20$	$x \geq 20$
	Public Debt in Foreign Currency (% of GDP)	$x \leq 30$	$30 < x < 60$	$x \geq 60$
	Public Debt Held by Nonresidents (% of GDP)	$x \leq 30$	$30 < x < 60$	$x \geq 60$
Projections	Change in Debt (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Due to Primary Deficit (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Due to Real Interest Rate (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Due to Real GDP Growth Rate (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Due to Exchange Rate (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Due to Other Factors (pp)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	Fiscal Expenditures	$x \leq 20$	$20 < x < 35$	$x \geq 35$
	Interest Payments	$x \leq 2$	$2 < x < 3$	$x \geq 3$
	Effective Interest Rate (Ave. on PDOD)	$x \leq 2$	$2 < x < 5$	$x \geq 5$
	Primary Fiscal Balance (% of GDP)	$x \geq 0$	$-3 < x < 0$	$x \leq -3$
	Primary Gap Indicator (% of GDP)	$x \leq 0$	$0 < x < 3$	$x \geq 3$
	i-g Differential (pp)	$x \leq -1$	$-1 < x < 0$	$x \geq 0$
	Gross Financing Needs (% of GDP)	$x \leq 10$	$10 < x < 15$	$x \geq 15$
	Public Debt Service (% of GDP)	$x \leq 10$	$10 < x < 30$	$x \geq 30$
Interest Payments (% of GDP)	$x \leq 5$	$5 < x < 10$	$x \geq 10$	
Amortization (% of GDP)	$x \leq 10$	$10 < x < 20$	$x \geq 20$	
<b>EXTERNAL DEBT</b>		<b>Low</b>	<b>Moderate</b>	<b>High</b>
Structure	External Debt (% of GDP)	$x \leq 25$	$25 < x < 75$	$x \geq 75$
	Long-term PPG Debt (% of GDP)	$x \leq 15$	$15 < x < 45$	$x \geq 45$
	Concessional (Bilateral and Multilateral) (% of GDP)	$x \geq 12$	$7 < x < 12$	$x \leq 7$
	Nonconcessional (Bilateral and Multilateral) (% of GDP)	$x \leq 2$	$2 < x < 20$	$x \geq 20$
	Private Creditors (% of GDP)	$x \leq 4$	$4 < x < 10$	$x \geq 10$
	Long-term PNG Debt (% of GDP)	$x \leq 10$	$10 < x < 20$	$x \geq 20$
	Short-term Debt (PPG and PNG) (% of GDP)	$x \leq 1$	$1 < x < 5$	$x \geq 5$
	Short-term Debt (PPG and PNG) (% of Exports)	$x \leq 5$	$5 < x < 25$	$x \geq 25$
	PRC Lending (estimated DOD) (% of GDP)	$x \leq 2$	$2 < x < 8$	$x \geq 8$
	External Debt with Variable Rate (% of Total External Debt)	$x \leq 30$	$30 < x < 50$	$x \geq 50$
	Debt Service (% of Exports)	$x \leq 10$	$10 < x < 25$	$x \geq 25$
	PPG Debt Service (% of Exports)	$x \leq 7$	$7 < x < 15$	$x \geq 15$
	PPG Interest payments (% of Exports)	$x \leq 2$	$2 < x < 3$	$x \geq 3$
	PPG Amortization (% of Exports)	$x \leq 10$	$10 < x < 20$	$x \geq 20$
PPG Debt Service owed to Commercial Creditors (% of PPG Debt Service)	$x \leq 5$	$5 < x < 10$	$x \geq 10$	
PPG Debt Service to PRC (% of PPG Debt Service)	$x \leq 5$	$5 < x < 10$	$x \geq 10$	
Other Indicators	Effective Interest Rate (Ave. on EDOD)	$x \leq 1$	$1 < x < 2.5$	$x \geq 2.5$
	External Gross Financing Needs (% of Exports)	$x \leq 50$	$50 < x < 100$	$x \geq 100$
	FX Reserves / EFN (No. of Years)	$x \geq 3$	$1 < x < 3$	$x \leq 1$
	FX Reserves / Short-term Debt (No. of Years)	$x \geq 10$	$2 < x < 10$	$x \leq 2$
	FX Reserves / Imports (No. of Months)	$x \geq 12$	$6 < x < 12$	$x \leq 6$
<b>MACRO-FINANCIAL AND RATINGS</b>		<b>Low</b>	<b>Moderate</b>	<b>High</b>
Macro-Financial	Current Account Balance (% of GDP)	$x \geq 0$	$-5 < x < 0$	$x \leq -5$
	Depreciation of the Real Exchange Rate	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Inflation Rate (ADO) (% Change)	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Nonperforming Loans (% of Total Loans)	$x \leq 3$	$3 < x < 5$	$x \geq 5$
	Market Lending Rates (%)	$x \leq 5$	$5 < x < 10$	$x \geq 10$
Ratings	Credit Rating Scale (0–20)	$x \leq 10$	$10 < x < 5$	$x \geq 5$
	IMF Risk Rating (lower-income economies) or EMBI Spread (market-access economies) (Basis Points)	Low $x \leq 200$	Moderate $200 < x < 600$	High $x \geq 600$

ADO = Asian Development Outlook, EDOD = external debt outstanding, EMBI = Emerging Market Bonds Index, EFN = external financing needs, FX = foreign reserves, GDP = gross domestic product, i-g = interest-growth, PDOD = public debt outstanding, PNG = private nonguaranteed, pp = percentage point, PPG = public and publicly guaranteed, PRC = People's Republic of China.

Source: Authors.

## APPENDIX 3: DEFINITIONS AND SOURCES OF THE INDICATORS

PUBLIC DEBT			
INDICATOR	UNIT	DEFINITION	DATA SOURCE
<b>Public Debt</b>	% of GDP	Public debt refers to the general government's gross debt, which includes all liabilities in the form of interest payments and/or principal payments of the government owed to the lenders that needs to be paid at specific dates in the future. Debt liabilities, usually valued at the nominal or face values, can include loans, currency and deposits, debt securities, special drawing rights (SDR), pensions, insurance, and other accounts payable (IMF 2022e). Thresholds are based on IMF cutoff for debt carrying capacity: strong (70% of GDP), weak (35% of GDP).	ASDM Database
<b>Public debt minus Threshold (Breach)</b>	% of GDP	The thresholds of public debt (% of GDP) are determined by an economy's debt carrying capacity. Weak: 35% of GDP, Moderate: 55% of GDP, Strong: 70% of GDP. All market-access economies have strong debt carrying capacity. The breach is computed as debt (% of GDP) for time t minus threshold. The thresholds are based on UNDP (2021).	ASDM Database
<b>Public debt in foreign currency</b>	% of Total Public Debt	Public debt in foreign currency refers to the stock of public debt borrowed in currencies other than the local currency. Thresholds are based on distribution.	IMF World Economic Outlook (WEO) Historical Database
<b>Public debt held by nonresidents</b>	% of Total Public Debt	Public debt held by nonresidents refers to the stock of public debt held by nonresidents of the economy. Thresholds are based on distribution.	IMF WEO (Historical Database)
<b>Change in Debt</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1. Thresholds are based on distribution.	ASDM Database
<b>Due to Primary Deficit</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1 due to the primary deficit. Thresholds are based on distribution.	ASDM Database
<b>Due to Interest rate</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1 due to the interest rate. Thresholds are based on distribution.	ASDM Database
<b>Due to Growth rate</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1 due to growth. Thresholds are based on distribution. Source:	ASDM Database
<b>Due to Exchange rate</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1 due to exchange rate. Thresholds are based on distribution.	ASDM Database
<b>Due to Other Factors Creating Debt (percentage point, not identified elsewhere)</b>	pp	Percentage point change in public debt to GDP ratio in time t from t-1 due to other factors creating debt (percentage point, not identified elsewhere). Thresholds are based on distribution.	ASDM Database
<b>Fiscal Balance</b>	% of GDP	Fiscal balance is the difference between fiscal revenue fiscal expenditure. Considered as an indicator of the general government's financial impact in the economy, it measures the general government's net lending (or its available financial resources that can be used by other sectors in the economy) or its net borrowing (its use of the financial resources available from other sectors in the economy) (IMF 2022e). Thresholds are based on distribution.	ASDM Database

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Table: continued

PUBLIC DEBT			
INDICATOR	UNIT	DEFINITION	DATA SOURCE
<b>Fiscal Revenues</b>	% of GDP	Fiscal revenue includes general government's taxes, social contributions, grants receivable, and other revenue sources. It augments government's net worth, i.e., the difference between government's assets and liabilities (IMF 2022e). Thresholds are based on distribution.	ASDM Database
<b>Fiscal Expenditures</b>	% of GDP	Fiscal expenditure as percent of GDP includes general government's total expense and the net acquisition of nonfinancial assets (IMF 2022e). Thresholds are based on distribution.	ASDM Database
<b>Interest Payments</b>	% of GDP	Interest payments are expenses incurred by the general government as payment for the use of the lender's funds (IMF 20214a). Thresholds are based on distribution.	ASDM Database
<b>Effective Interest Rate</b>	Ave. on PDOD	Computed effective interest rates using interest payments and the public debt stock. Thresholds are based on distribution.	ASDM Database
<b>Primary Fiscal Balance</b>	% of GDP	Primary fiscal balance is fiscal balance plus net interest payable/paid (interest expense minus interest revenue). Thresholds are based on distribution.	ASDM Database
<b>Primary Gap Indicator</b>	% of GDP	The gap between debt stabilizing primary balance, $pb^*$ and the estimated primary balance, $pb$ . $pb^* - pb = (i-g)d/(1+g) - pb$ where $i$ = real interest rate, $g$ = real growth rate, and $d$ = debt stock ratio (to GDP) in the previous period. Thresholds are based on distribution.	Author's computations based on ASDM Database
<b>i-g Differential</b>	pp	Real interest rate minus real GDP growth rate. Thresholds are based on distribution.	Author's computations based on ASDM Database
<b>Gross Financing Needs</b>	% of GDP	Sum of amortization and fiscal balance, as percent of GDP. Amortization data are from government reports and other sources such as CEIC and Haver. Thresholds are based on IMF cutoff for higher scrutiny countries i.e., 15% for advanced economies and 10% for emerging economies.	Authors' computations based on ASDM Database, WEO Historical Database, CEIC, Haver, and Official country reports
<b>Public Debt Service</b>	% of Revenues	Public debt service is equal to sum of principal payments (amortization) and interest payments, as percent of fiscal revenues. Thresholds are based on distribution.	Authors' computations based on ASDM Database, WEO Historical Database, and Official country reports
<b>Interest Payments</b>	% of Revenues	General government interest payments expressed as percent of fiscal revenues. Thresholds are based on distribution.	Authors' computations based on ASDM Database
<b>Amortization</b>	% of Revenues	General government principal payments expressed as percent of fiscal revenues. Thresholds are based on distribution.	Authors' computations based on ASDM Database, WEO Historical Database, and Official country reports

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Table: continued

<b>EXTERNAL DEBT</b>			
<b>INDICATOR</b>	<b>UNIT</b>	<b>DEFINITION</b>	<b>DATA SOURCE</b>
<b>External Debt</b>	% of GDP	Gross external debt is the outstanding amount of all liabilities in the form of interest payments and/or principal payments of all the residents of an economy that are owed to nonresidents, which are required to be paid at specific dates in the future (IMF 2003). It consists of short-term external debt, public and publicly guaranteed long-term external debt, private nonguaranteed long-term external debt, and the use of International Monetary Fund credit and SDR allocation (World Bank 2022c). Thresholds are based on the prescribed level of external debt (% of GDP) in IMF-WB External DSA.	ASDM Database based on World Bank International Debt Report (IDR)
<b>Long-term PPG Debt</b>	% of GDP	Public and publicly guaranteed (PPG) long-term external debt is the outstanding amount of debt by the public sector and the private debtors guaranteed for repayment by the public sector, with an original or extended maturity of more than 1 year (World Bank 2022c). Thresholds are based on distribution.	ASDM Database based on World Bank IDR
<b>Concessional (Bilateral and Multilateral)</b>	% of GDP	Concessional debt is the outstanding amount of the PPG external long-term debt at concessional terms to the official lenders and it usually consists of loans with an original grant element of 35% or more. Examples of concessional debt are loans from regional development banks such as the Asian Development Bank, Inter-American Development Bank, and African Development Bank (World Bank 2022c). Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Nonconcessional (Bilateral and Multilateral)</b>	% of GDP	Nonconcessional debt is the outstanding amount of the PPG external long-term debt to official lenders that are not classified under concessional debt. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Private Creditors</b>	% of GDP	PPG long-term external debt to private creditors is the outstanding amount of debt owed to bondholders, commercial banks, and other trade-related lenders, who are nonresidents in the economy (World Bank 2022c). Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Long-term PNG Debt</b>	% of GDP	Private nonguaranteed long-term external debt is the outstanding amount of debt owed by the private sector to external creditors that is not guaranteed by the public sector and it usually an original or extended maturity of more than 1 year (World Bank 2022c). Thresholds are based on distribution.	ASDM Database based on World Bank IDR
<b>Short-term Debt (PPG and PNG)</b>	% of GDP	External DOD with maturity of 1 year or less. Thresholds are based on distribution.	ASDM Database based on World Bank IDR
<b>Short-term Debt (PPG and PNG)</b>	% of Exports	External DOD with maturity of 1 year or less. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>PRC Lending (estimated DOD)</b>	% of GDP	Data is from AidData Chinese Development Finance Database v2.0 (up to 2017). Debt outstanding is computed using maturity information of loans, and when maturity is not available, it is assumed that the loan remains outstanding as of 2017. For 2018 and 2019, data is from Boston University's China Development Finance dataset. Thresholds are based on distribution.	Authors' computations based on AidData Chinese Development Finance Database v2.0 (up to 2017), AidData (2022); Ray, R.et al. (2022). Boston University's China Development Finance (2018 to 2019)

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Table: continued

<b>EXTERNAL DEBT</b>			
<b>INDICATOR</b>	<b>UNIT</b>	<b>DEFINITION</b>	<b>DATA SOURCE</b>
<b>External Debt with Variable Rate</b>	% of Total External debt	External debt with variable rate is the outstanding amount debt with floating interest rates, moving in accordance with a key market rate (e.g. the London interbank offered rate (LIBOR) or the US prime rate). This indicator provides information on the economy's exposure to any movements and volatilities in the international interest rates (IDS Metadata Glossary). Thresholds are based on distribution.	Authors' computations based on World Bank IDS
<b>Debt Service</b>	% of Exports	Interest payments and principal payments paid to external creditors by all sectors, as percent of exports. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>PPG Debt Service</b>	% of Exports	Interest payments and principal payments paid to external creditors by PPG, as percent of exports. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Interest Payments – PPG</b>	% of Exports	Interest payments paid to external creditors by PPG, as percent of exports. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Amortization – PPG</b>	% of Exports	External PPG principal payments, expressed as percent of exports. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>PPG Debt Service Owed to Commercial Creditors</b>	% of PPG Debt Service	Debt service due from PPG to external commercial lenders, as share of total PPG external debt service. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>PPG Debt Service to PRC</b>	% of PPG Debt Service	Sum of debt service (interest and principal payment) due to the People's Republic of China. It includes debt service to official, non-official loans and bonds. Data computed from the Debt Service Suspension Initiative database. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>Effective Interest Rate</b>	Ave. on EDOD	Computed effective interest rates using interest payments and the external debt stock. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>External Gross Financing Needs (EFN)</b>	% of Exports	Sum of principal payments on total external debt stock, short-term debt, minus current account balance, expressed as % exports. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>FX Reserves / EFN</b>	No. of years	Ratio of foreign currency reserves to EFN. Thresholds are based on distribution.	Authors' computations based on ASDM Database
<b>FX Reserves / Short-term debt</b>	No. of years	Ratio of foreign currency reserves to short-term external debt. Thresholds are based on distribution.	Authors' computations based on ASDM Database and World Bank IDR
<b>FX Reserves / Imports</b>	No. of months	Ratio of foreign currency reserves expressed in months of imports. Thresholds are based on distribution.	Authors' computations based on ASDM Database

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MACRO-FINANCIAL			
INDICATOR	UNIT	DEFINITION	DATA SOURCE
<b>Current Account Balance</b>	% of GDP	Current account balance is the sum of net exports of goods and services, net primary income, and net secondary income. Low risk is the ideal situation when current account balance is zero or in surplus. High risk threshold is based on distribution.	ASDM Database
<b>Depreciation of the real exchange rate</b>	% change	Percent change of real exchange rate, which is nominal exchange rate multiplied by the ratio of US GDP deflator and domestic GDP deflator. Thresholds are based on distribution.	ASDM Database
<b>Inflation Rate (ADO)</b>	%	Change in the CPI. Based on prescribed level or target inflation of 3% in literature.	Asian Development Outlook
<b>Nonperforming Loans (% of Total Loans)</b>	% of Total Loans	Ratio of nonperforming loans to total loans of the banking system. Latest data is Q2 2022 for Maldives, Indonesia, PNG, and the Philippines; Q1 2022 for Bangladesh, Brunei Darussalam, Cambodia, the Lao PDR, Malaysia, Thailand, Viet Nam, Samoa, and Tonga. For the rest, latest is up to Q4 2021. Thresholds are based on distribution.	CEIC
<b>Market Lending Rates</b>	%	Defined as lending rate for Armenia; Bhutan; Brunei Darussalam; Cambodia; Fiji; Indonesia; Georgia; the Kyrgyz Republic; Malaysia; Maldives; the Federated States of Micronesia; Papua New Guinea; Samoa; Singapore; Solomon Islands; the Republic of Korea; Taipei, China; Thailand; Timor-Leste; Tonga; Uzbekistan; Vanuatu; Viet Nam and weighted average lending rate in Sri Lanka; Azerbaijan; Kazakhstan; Mongolia; Tajikistan. Commercial banks' average lending rate in Bangladesh; Hong Kong, China; India; Nepal, Pakistan; Philippines. Lending Rate long-term in the PRC and the Lao PDR. Lending rate Maximum secured loan in Myanmar. Thresholds are based on distribution.	CEIC

RATINGS			
INDICATOR	UNIT	DEFINITION	DATA SOURCE
<b>Credit Rating Scale</b>	Scale	Average of Moody's, S&P, and Fitch alphanumeric ratings converted to a scale of 1 to 20, with 20 as the highest and 0 as the lowest. Prime credit rating is equivalent to a score of 20, and in default is zero. Low risk means the rating is better than non-investment grade speculative, and high risk are those with rating worse than highly speculative.	Authors' computations based on data from Moody's, S&P, and Fitch
<b>IMF Risk Rating (lower-income economies) or EMBI Spread (market-access economies)</b>	Rating	EMBI Spread: This is spread from the JP Morgan Emerging Bonds Index. Thresholds are based on distribution. IMF Risk Rating is the risk assessment taken from the latest IMF-World Bank DSF.	World Bank World Development Indicators, Bloomberg, IMF/World Bank Debt Sustainability Framework, IMF Article IV of respective economies

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OTHER FACTORS			
INDICATOR	UNIT	DEFINITION	
Other Factors	Remark	Indicates whether the economy has a sovereign wealth fund (SWF), trust fund (TF), Compact Trust Fund (CTF), or pool of cash reserves (CD) with value exceeding 20% of GDP (2021); fixed or managed exchange rate regime (FMX); sizable private debt: household (HH), nonfinancial corporate (NFC), or financial corporate (FC) debt exceeding 60% of GDP; nature of the loans e.g., India hydropower loans in Bhutan and PPP loans in Mongolia; and structure of the economy e.g., Singapore and Hong Kong, China as financial centers (FIN).	SWFI (2022), IIF (2022), CEIC, AidData (2022).

ADO = Asian Development Outlook, ASDM = Asia Sovereign Debt Monitor, DSF = debt sustainability assessment framework, EDOD = external debt outstanding, EMBI = Emerging Market Bonds Index, EFN = external financing needs, FX = foreign reserves, GDP = gross domestic product, IDR = International Debt Report, IMF = International Monetary Fund, Lao PDR = Lao People's Democratic Republic, NFC = nonfinancial corporate, PDOD = public debt outstanding, PNG = private nonguaranteed, pp = percentage point, PPG = public and publicly guaranteed, PRC = People's Republic of China, SWFI = Sovereign Wealth Fund Institute, US = United States.

Source: Authors.

## REFERENCES

- AidData. 2022. “Banking on the new Belt and Road: Insights from a new global dataset of 13, 427 Chinese development projects.” <https://www.aiddata.org/publications/banking-on-the-belt-and-road>.
- . China’s Global Public Diplomacy Dashboard Dataset, Version 2.0. <http://china-dashboard.aiddata.org> (accessed 22 September 2022).
- ASEAN+3 Macroeconomic Research Office (AMRO). 2020. “AMRO Annual Consultation Report: Lao PDR – 2020.” *Country Report ACR/20-01*. Singapore. <https://www.amro-asia.org/amros-2020-annual-consultation-report-on-lao-pdr/>.
- Asian Development Bank (ADB). 2022a. *Asian Development Outlook 2022*. Manila.
- . 2022b. *ADO Supplement, July 2022*. Manila.
- . 2022c. *ADO 2022 Update*. Manila.
- . 2022d. *ADO Supplement, December 2022*. Manila.
- . 2022e. *Public Sector (Sovereign) Financing*. Manila. <https://www.adb.org/what-we-do/public-sector-financing/lending-policies-rates>.
- . 2022f. *Technical Assistance for Sovereign Debt Analytics and Management Support*. Manila.
- ADB. 2020a. *Asian Development Outlook (ADO) 2020*. Manila.
- . 2020b. *ADO Supplement, July 2020*. Manila.
- . 2020c. *ADO 2020 Update*. Manila.
- . 2020d. *ADO Supplement, December 2020*. Manila.
- . 2021a. *ADO 2021*. Manila.
- . 2021b. *ADO Supplement, July 2021*. Manila.
- . 2021c. *ADO 2021 Update*. Manila.
- . 2021a. *ADO Supplement, December 2021*. Manila.
- ADB. 2019. *Technical Assistance for Debt Analytics and Technical Capacity Building*. Manila.
- Bank of Lao P.D.R. 2023. External Sector Statistics. [https://www.bol.gov.la/en/External\\_Sectors](https://www.bol.gov.la/en/External_Sectors) (accessed 3 January 2023).
- Bloomberg Finance L.P. Bloomberg EMBI Spreads (accessed 20 October 2022).
- Bruegel. 2022. Real effective exchange rates for 178 countries: A new database. <https://www.bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database> (accessed 20 October 2023).

CEIC. Global Database. CEIC. <https://insights.ceicdata.com/>.

Central Bank of Sri Lanka. 2023. External Sector Statistics. <https://www.cbsl.gov.lk/en/statistics/statistical-tables/external-sector> (accessed 20 January 2023).

Economynext. 2022. “Sri Lanka continuing payments to multilateral creditors.” 3 August. <https://economynext.com/sri-lanka-continuing-payments-to-multilateral-creditors-minister-98920/>.

Haver. Haver Analytics DLX Database (accessed 15 November 2022).

Federal Reserve Bank of St. Louis. 2022. Economic data. <https://fred.stlouisfed.org/> (accessed 20 October 2022).

Ferrarini, Benno. 2019. “Asian Development Forecast Accuracy 2007–2016.” *ADB Economics Working Paper Series* 548. Manila. <https://www.adb.org/publications/ado-forecast-accuracy-2007-2016>.

Ferrarini, Benno and Suzette Dagli. 2022. “Sovereign Debt Heat Maps for Asia and the Pacific.” Asian Development Bank – Economic Research and Regional Cooperation Department. September 2022. Unpublished manuscript for internal circulation among ADB Board Members.

Institute of International Finance. 2022. Global Debt Monitor. <https://www.iif.com/Products/Global-Debt-Monitor> (accessed 15 November 2022).

International Monetary Fund (IMF). 2022a. “IMF Staff Reaches Staff-Level Agreement on an Extended Fund Facility Arrangement with Sri Lanka.” Press Release no. 22/295. Washington, DC. <https://www.imf.org/en/News/Articles/2022/09/01/pr22295-imf-reaches-staff-level-agreement-on-an-extended-fund-facility-arrangement-with-sri-lanka>.

———. 2022b. List of LIC DSAs for PRGT-Eligible Countries. <https://www.imf.org/external/pubs/ft/dsa/dsalist.pdf> (accessed 12 October 2022).

———. 2022c. “Pakistan Seventh and Eighth Reviews under the Extended Arrangement under the Extended Fund Facility, Requests for Waivers of Non-observance of Performance criteria, and for Extension, Augmentation, and Rephasing of access—Press Release; Staff Report; Staff Statement; and Statement by the Executive Director for Pakistan.” *IMF Country Report* 22/288. Washington, DC.

———. 2022d. Staff Guidance Note on the Sovereign Risk and Debt Sustainability Framework for Market Access Countries. IMF Policy Paper No. 2022/039. Washington, DC. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2022/08/08/Staff-Guidance-Note-on-the-Sovereign-Risk-and-Debt-Sustainability-Framework-for-Market-521884>.

———. 2022e. *World Economic Outlook October*. Washington, DC.

———. 2022f. *World Economic Outlook April*. Washington, DC.

———. Global Debt Monitor. <https://www.imf.org/external/datamapper/datasets/GDD> (accessed 15 December 2022).

———. Government Finance Statistics (GFS). <https://www.imf.org/external/datamapper/datasets/GDD> (accessed 15 November 2022).

———. International Financial Statistics (IFS). <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&slid=-1> (accessed 15 November 2022).

IMF. 2021a. “Mongolia 2021 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for Mongolia.” *IMF Country Report* 21/251. Washington, DC.

———. 2021b. “Review of the Debt Sustainability Framework for Market Access Countries.” *IMF Policy Paper* 2021/003. Washington, DC.

———. 2021c. “Sri Lanka 2021 Article IV Consultation —Press Release; Staff Report; and Statement of the Executive Director for Sri Lanka.” *IMF Country Report* 22/91. Washington, DC.

———. 2019. “Lao People’s Democratic Republic 2019 Article IV Consultation—Press Release; Staff Report; and Statement of the Executive Director for Lao PDR.” *IMF Country Report*. 19/267. Washington, DC.

———. 2014a. *Government Finance Statistics Manual*. Washington, DC.

———. 2014b. “Republic of Armenia Request for Arrangement under the Extended Fund Facility; Staff Report; Press Release; and Statement by the Executive Director for the Republic of Armenia.” *IMF Country Report* 14/89. Washington, DC.

———. 2003. *External Debt Statistics: Guide for Compilers and Users*. Washington, DC.

Irwin, Timothy C. 2022. Contingent liabilities: Monitoring exposures that are difficult to measure. In *The Sustainability of Asia’s Debt: Problems, Policies, and Practices*, ed. by Benno Ferrarini, Marcelo Giugale, and Juan Pradelli, pp. 299–316. Cheltenham: Edward Elgar Publishing and Manila: ADB. <https://www.e-elgar.com/shop/gbp/the-sustainability-of-asia-s-debt-9781800883710.html>.

Lawder, David and Jorgelina Do Rosario. 2022. “Pakistan seeks rescheduling \$27 billion bilateral debt.” *Reuters*, 15 October. <https://www.reuters.com/markets/asia/pakistan-seeks-rescheduling-27-bln-bilateral-debt-finance-minister-2022-10-15/>.

Outlook. 2022. “India Emerges As Sri Lanka’s Biggest Lender In 2022, Gives \$376.9 Million To Rescue Crisis-Hit Country.” 18 July. <https://www.outlookindia.com/international/india-emerges-as-sri-lanka-s-biggest-lender-in-2022-gives-376-9-million-to-rescue-crisis-hit-country-news-210129>.

Panizza, Ugo. 2022. Fiscal uncertainty: the thankless task of forecasting Asia’s fiscal accounts. In *The Sustainability of Asia’s Debt: Problems, Policies, and Practices*, ed. by Benno Ferrarini, Marcelo Giugale, and Juan Pradelli, pp. 239–268. Cheltenham: Edward Elgar Publishing and Manila: ADB. <https://www.e-elgar.com/shop/gbp/the-sustainability-of-asia-s-debt-9781800883710.html>.

Rana, Shahbaz. 2022. “Pakistan seeks \$6.3b China debt rollover.” *The Express Tribune*, 23 October. <https://tribune.com.pk/story/2383139/pakistan-seeks-63b-china-debt-rollover>.

Ray, Rebecca, Kevin P. Gallagher, Willima Kring, Joshua Pitts, and B. Alexander Simons. 2022. Geolocated Dataset of Chinese Overseas Development Finance. *Scientific Data* 8 (241) and Boston University Global Development Policy Center. Online database. doi: 10.17605/OSF.IO/7WUXV (accessed 5 October 2022).

Sovereign Wealth Fund Institute. Rankings by Total Assets. <https://www.swfinstitute.org/fund-rankings/> (accessed on 15 November 2022).

S&P Capital IQ Market Intelligence Database. Credit Ratings (accessed 15 November 2022).

UNDP. 2021. "Sovereign Debt Vulnerabilities in Developing Economies." *Policy Brief*. New York. <https://www.undp.org/library/dfs-sovereign-debt-vulnerabilities-developing-economies>.

VOA News. 2022. Laos Faces Debt Crisis After Borrowing Billions from China (1 July). <https://www.voanews.com/a/laos-faces-debt-crisis-after-borrowing-billions-from-china-/6641633.html>.

World Bank. 2022a. Debt & Fiscal Risks Toolkit. Washington, DC. <https://www.worldbank.org/en/programs/debt-toolkit/dsf>.

———. 2022b. *Debt Transparency: Debt Reporting Heat Map*. Washington, DC. <https://www.worldbank.org/en/topic/debt/brief/debt-transparency-report>.

———. 2022c. *International Debt Report 2022*. Washington, DC (accessed 15 December 2022).

———. International Debt Statistics (IDS) Metadata Glossary. <https://databank.worldbank.org/metadataglossary/international-debt-statistics/series> (accessed 3 February 2022).

———. World Development Indicators. Washington, DC (accessed 15 December 2022).

## **Sovereign Debt Vulnerabilities in Asia and the Pacific**

Debt ratio projections and heat maps in this paper show evidence of widening pockets of vulnerability across much of Asia and the Pacific. While the outlook is not yet suggestive of a widespread debt meltdown looming in the region, the global environment presents major challenges. Obstacles to economic growth and rising borrowing costs risk jeopardizing countries' efforts toward restoring public finances and ensuring their sustainability after a series of major crises. Countries in or close to distress face complications from a complex creditors landscape.

### **About the Asian Development Bank**

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

