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Debt Sustainability in Emerging Market Economies after the Covid-19 Shock

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ABSTRACT

The Covid-19 pandemic has imposed major fiscal shocks to emerging market economies (EMEs) from output and revenue loss and from relief expenditures and government credit support. In some economies there has been partially compensating alleviation from lower interest rates. This study examines debt burden metrics for 11 major EMEs to gauge the severity of the shock. It confirms the prevalent perception that Brazil, South Africa, and Turkey have experienced the most severe deteriorations in public debt sustainability, and identifies Colombia and India as also warranting caution. Mexico and Indonesia comprise a middle-risk tier; and Chile, Philippines, Malaysia, and Thailand, a low-risk tier. An important difference from debt crises in the 1980s and 1990s is that most EME sovereign debt is now primarily in domestic currency and owed to domestic holders, reducing vulnerability to exchange rate depreciation and the relevance of externally coordinated debt relief. Medium-term projections examining the sensitivity of debt burdens to upward pressure on real interest rates find Brazil, South Africa, and India relatively more affected as a consequence of relatively high baseline debt and interest burdens. Overall, so far there has been no generalized slide of the major emerging market economies into unsustainable debt burdens requiring debt renegotiation with partial forgiveness. However, it will be important for the countries more at debt risk to achieve their baseline improvements in primary fiscal balances currently projected by the International Monetary Fund.

Keywords: Emerging Markets, Debt Sustainability
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Introduction

The Covid-19 pandemic shock has imposed widespread increases in public debt for both advanced economies and emerging market and developing economies. Recession associated with lockdowns has eroded revenue while increasing public expenditures for unemployment benefits and health-disaster relief. However, there has been some offsetting fiscal relief from a decline in interest rates, reflecting central bank cuts in policy rates and new bond purchases (quantitative easing), not only in the United States and other advanced economies but also in emerging market economies.

This study examines whether the pandemic debt shocks are likely to necessitate a new round of public debt forgiveness for emerging market economies, similar to the Brady Plan that orchestrated negotiated debt reductions following the Latin American debt crisis of the 1980s.² The international financial institutions have already launched measures for relief for debt owed to the official sector by low-income countries. However, for major emerging market economies there is a strong incentive to preserve credit reputations built up over decades at considerable effort. Moreover, public debt in these economies tends to be owed more to their own citizens (rather than foreigners), and in their own currencies, than in earlier decades.

The analysis first gauges the severity of the pandemic recession, comparing it to the Great Recession (or Global Financial Crisis, GFC) of 2007-2010 as well as measuring output losses against pre-pandemic baselines. It then turns to measurement of the impact on public debt sustainability in eleven major emerging market economies, representing nearly one-fifth of the world economy at purchasing-power exchange rates. Alternative metrics include the ratio of debt to GDP, interest to GDP, and a proposed measure of the “real debt service ratio”. Other key indicators including capital flows, real interest rates, and credit default swap rates are also considered.

The study concludes with a more detailed examination of debt sustainability for the three emerging market economies found to be most at risk: Brazil, South Africa, and Turkey, as well as two others with higher than average risk among eleven economies examined: India and Colombia.

Recession Severity

In April, 2020, the Chief Economist of the International Monetary Fund wrote that the Covid-19 lockdown would cause the “worst recession since the Great Depression, ... far worse than the Global Financial Crisis” (Gopinath, 2020). However, in part because of massive fiscal stimulus in several economies (especially the United States), but also reflecting the temporary nature of lockdowns, the recession was sharp but also short. Cumulative global growth over three years from the pre-recession base is on track to be only modestly less (rather than “far

² See Cline (1995).

worse”) than in the Global Financial Crisis. As shown in Table 1, the most recent World Economic Outlook (WEO) projections of the International Monetary Fund indicate that from 2007 to 2010 world output grew by 8.6 percent. In comparison, global growth from 2019 to 2022 is projected to reach 7.6 percent.

Table 1

Cumulative Three-year Percent Growth after Pre-Recession Year:
Great Recession and Covid-19 Pandemic

	Output Share ^a	Pre-recession Year:		Difference
		2007.	2019	
World	100	8.56	7.60	-0.96
Advanced Economies	43.10	0.03	4.98	4.95
US	21.40	0.16	7.69	7.52
Euro Area	17.15	-2.06	2.66	4.72
Japan	3.96	-3.03	0.79	3.82
UK	2.33	-2.40	1.08	3.47
EMDEs ^b	56.90	16.69	9.54	-7.15
China	17.31	32.67	16.74	-15.93
EM12:	20.42			-8.44
Argentina	0.77	7.81	-0.76	-8.57
Brazil	2.41	12.86	2.49	-10.37
Chile	0.35	7.86	7.09	-0.76
Colombia	0.57	9.16	4.14	-5.02
Mexico	1.95	0.70	1.32	0.62
India	7.09	24.26	10.21	-14.05
Indonesia	2.47	19.67	7.07	-12.60
Malaysia	0.70	11.02	3.51	-7.50
Philippines	0.70	13.62	-0.78	-14.40
Thailand	0.99	8.61	-0.97	-9.58
South Africa	0.57	4.69	0.36	-4.33
Turkey	1.83	4.04	14.55	10.52

a. 2019 at purchasing-power parity

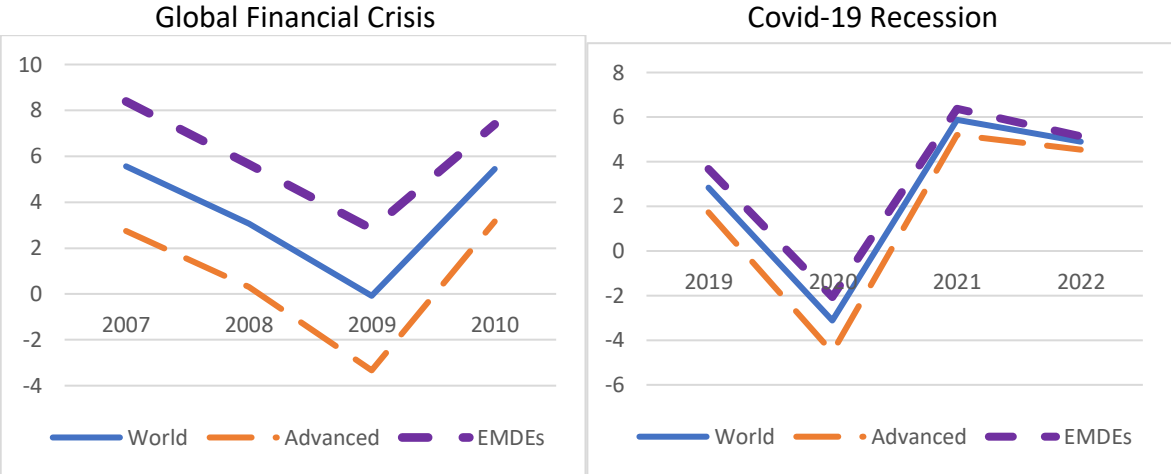
b. Emerging Market and Developing Economies

Source: Calculated from IMF (2021a)

Nonetheless, whereas the GFC was more concentrated in the advanced economies, reflecting the financial-center shocks that triggered it, the Covid-19 recession has been truly global, reflecting the nature of a pandemic. For the advanced economies, the outcome has been *better* than in the great recession, whereas for emerging market and developing economies (EMDEs) it has been considerably worse. As shown in table 1, by 2010 after the GFC output in advanced economies had only returned to the level of its pre-recession base in 2007. In contrast, by 2022 output in advanced economies is projected to reach 5 percent above its pre-pandemic base in 2019. For EMDEs, the comparison between the two global recessions is the reverse, as output rose by about 17 percent from 2007 to 2010 but will have increased by 10 percent from 2019 to 2022. As shown in figure 1, technically the EMDEs as a group did not experience a recession but a growth slowdown in the GFC, whereas they suffered a short but sharp recession in the Covid-19 shock that closely resembled that of the advanced economies.

Figure 1

Annual Growth Outcomes in the GFC and Covid-19 Recessions:
World, Advanced Economies, and EMDEs (percent)



Source: IMF (2021c)

Among major economies, the most extreme cases in this contrast are the United States and China. Three-year cumulative growth was approximately zero for the United States in the Great Recession but is on track to reach nearly 8 percent in the Covid-19 recession. Conversely, China’s real output rose a cumulative 33 percent from 2007 to 2010, but is projected to rise by 17 percent from 2019 to 2022.

For 12 major emerging market economies excluding China, the overall pattern has similarly been a much poorer performance in the Covid-19 recession than in the Great Recession. The pandemic recession has been worse by cumulative double-digit percentage points for 4, worse by single digits for 6, and better for only two (Mexico and especially Turkey). Weighting by 2019 purchasing-power-parity (ppp) GDP, the three-year cumulative growth

outcome will have been 8.4 percentage points lower in the pandemic recession than in the Great Recession.

Comparison to Baseline; Pandemic Severity

Table 2 considers the Covid-19 recession impact by comparing the level of medium-term output (in 2024) projected by the IMF in the October 2019 WEO against that projected in its October 2021 WEO (IMF 2019, 2021a). Once again greater severity is found for emerging market economies than for advanced economies. The output level for 2024 is actually 0.1 percent *higher* than the pre-pandemic projection for the advanced economies as a group, and for the United States is almost 3 percent higher than in the pre-pandemic baseline.³ In contrast, for the emerging market and developing economies (EMDEs) as a group, the new projections show a loss of 5.1 percent from the 2024 level projected before the pandemic. For its part, China's change from the pre-pandemic baseline is also negative, but by considerably less than most of the other EMEs in the table, at only 2 percent lower. The contrast between tables 1 and 2 for China suggests that by 2019 the baseline for China's growth had already been substantially reduced from its high growth in 2007-2010.

Among the 12 emerging market economies reported in table 2 (excluding China), the five in Asia broadly follow a straight-line output reduction of about 10 percent from the pre-pandemic baseline for 2020 through 2024. There is greater recovery in Latin America, with 2024 output about 5 percent below the pre-pandemic baseline. South Africa resembles the Latin American pattern. Turkey is a positive outlier, showing a drop of only about 1 percent from the pre-pandemic baseline for 2020, and a positive difference of almost 5 percent by 2024.

Table 2 also reports the status of Covid-19 deaths and vaccinations as of mid-October, 2021. Three Latin American economies have had the worst outcome, with cumulative deaths averaging about 2,600 per million for Argentina, Brazil, and Colombia. A second-worst tier includes the United States, Mexico, and Chile, at an average of about 2,200 per million. The euro area has done considerably better, with deaths at about 1,700 per million (for the four largest member countries), despite leading the severe initial outbreak (particularly in Italy) and lagging behind the United States in the early 2021 rollout of vaccines. South Africa has experienced approximately the same deaths outcome as the euro area.

³ The US is already at 2.1 percent above the original baseline by 2022. However, the revised gross output gap in 2022 is now projected at 3.3 percent of potential GDP rather than 1.8 percent in the pre-pandemic baseline, indicating greater inflationary pressure.

Table 2

Output Shocks and Covid-19 Metrics

	Real GDP % Change from baseline ^a			Deaths per mn ^b	Percent Vaccinated ^d
	2020	2021	2024		
World	-6.3	-4.2	-3.2	659	52
Advanced Ec.	-6.1	-2.8	0.1
US	-5.4	-1.5	2.8	2356	68
Euro Area	-7.6	-4.3	-0.7	1705 ^c	76 ^c
Japan	-5.0	-3.2	0.5	146	79
UK	-11.1	-6.6	-2.9	2094	74
EMDEs	-6.3	-4.9	-5.1
China	-3.3	-1.4	-2.0	3	82
Argentina	-8.7	-3.3	-5.4	2541	79
Brazil	-6.0	-3.4	-4.7	2849	76
Chile	-8.6	-1.7	-4.9	1965	87
Colombia	-10.1	-6.7	-7.4	2477	66
Mexico	-12.7	-9.1	-4.9	2227	58
India	-13.3	-11.7	-12.4	332	54
Indonesia	-6.8	-8.6	-6.9	518	48
Malaysia	-9.6	-10.8	-8.8	904	78
Philippines	-14.8	-17.4	-17.0	413	30
Thailand	-8.8	-11.1	-10.1	288	65
South Africa	-7.4	-4.2	-4.6	1483	27
Turkey	-1.2	4.6	4.5	864	66

a. WEO, October 2021 versus October 2019

b. As of November 17, 2021

c. Germany, France, Italy, Spain only.

d. Includes those with only one dose

Sources: IMF (2019, 2021a); Worldometers (2021); Our World In Data (2021)

The sharpest difference, however, is between Europe and the Americas, on the one hand, and Asia on the other. The (unweighted) average for cumulative deaths in the five Asian emerging market economies (excluding China) is only 491 per million. Even more extreme,

deaths have been held to only 146 per million in Japan and a remarkably low 3 per million in China.⁴

Going forward, the key to ending the pandemic will be achieving high vaccination coverage. The vaccination imperative has become more apparent with the highly contagious Delta variant, and there are increasing doubts that zero-covid strategies based on lockdowns and country isolation can continue to succeed.⁵ Although the United States led the initial rollout of vaccinations in early 2021, by mid-November the US stood well behind other advanced economies as well as several major emerging market economies. Whereas only 68 percent of the population was vaccinated in the United States, the (unweighted) average percent vaccinated stood at 79 percent for the euro area, Japan, UK, China, Argentina, Brazil, Chile, and Malaysia. Emerging market economies with vaccination rates comparable to that in the United States included Colombia, Mexico, Thailand, and Turkey. However, among other emerging market economies vaccination coverage remained low in India and Indonesia (at about 50 percent) and especially the Philippines and South Africa (at about 30 percent).

Impact on the Debt to GDP Ratio for 11 Emerging Market Economies

The most direct measure of the shock to public debt from the Covid-19 pandemic is the change in the expected medium-term level of debt relative to GDP subsequent to the emergence of the pandemic. The successive baseline projections of the International Monetary Fund in its semi-annual report on the World Economic Outlook (WEO) provide a basis for measuring this change. Table 3 uses 2024, the most distant year included in the projections of the October 2019 WEO, as the benchmark for this comparison. The countries considered exclude Argentina because its succession of defaults and restructurings over the past two decades makes it unrepresentative.⁶

General government net debt as a percent of GDP is the most meaningful measure of the burden of debt when using debt stock. For example, Brazil's gross general government debt at the end of 2020 was 98.9 percent of GDP (IMF, 2021a), but its net debt was only 62.7 percent of GDP (table 3).⁷ However, for four economies (India, Malaysia, Philippines, and Thailand), only

⁴ Among advanced economies, five island states have also achieved exceptionally low death outcomes, with the advantage of being able to seal themselves off from the rest of the world as needed: Australia (74 per million as of November 17, 2021), New Zealand (7), Singapore (103), Hong Kong (28), and Taiwan (36) (Worldometer, 2021).

⁵ See for example "Zero-Covid Countries Have Run Out of Road," Editorial Board, *Financial Times*, November 14, 2021.

⁶ Argentina's most recent restructuring, in August 2020, imposed a reduction in value by about 50 percent on \$65 billion in foreign-law bonds. "Argentina's Debt Restructuring Deal Explained," *DW*, August 4, 2020. Also see Michael Stott and Lucinda Elliott, "Argentina and the IMF: The Looming Clash Over Its \$57 bn bailout," *Financial Times*, November 9, 2021.

⁷ At the end of 2020, Brazil's public sector assets included 19.5 percent of GDP in international reserves and 10.4 percent of GDP in assets of the National Development Bank (BNDES). IMF (2021c, p. 50); BNDES (2021).

the gross general government debt statistic is available, so their debt burdens shown in the table may be somewhat overstated in comparison those of the other economies.⁸

Table 3

	2019	2020	2021	2024		
				baseline	revised	change
Brazil	54.6	62.7	60.7	64.6	70.2	5.6
Chile	8.0	13.4	19.8	13.8	21.2	7.4
Colombia	43.0	54.4	57.6	34.1	59.9	25.9
Mexico	44.5	52.4	51.1	46.8	52.2	5.4
India ^a	74.1	89.6	90.6	65.6	87.3	21.7
Indonesia	27.0	33.0	38.0	27.2	40.1	12.8
Malaysia ^a	57.1	67.4	70.7	54.3	71.0	16.7
Philippines ^a	37.0	51.7	59.1	37.4	63.5	26.0
Thailand ^a	41.0	49.6	58.0	45.0	61.2	16.2
South Africa	50.8	63.3	64.7	73.7	75.0	1.3
Turkey	26.7	32.1	33.8	29.5	38.1	8.6
Median	43.0	52.4	58.0	45.0	61.2	16.2 ^b

a. Gross general government debt

b. Change in EM11 median. Median of individual changes: 12.8.

Source: IMF (2019, 2021a).

As shown in the final column of table 3, there were large increases in the medium-term (2024) debt ratios from those projected for 2024 before the Covid-19 shock to those after, amounting to double digit percentage points for 8 of the eleven economies. The largest increase was for Colombia, with the 2024 ratio surging by 25.9 percentage points, from a baseline 34 percent to a revised 59.9 percent.⁹ The median projected 2024 debt ratio for the EM11 rose from 45 percent of GDP to 61.2 percent, or by 16.2 percent of GDP.

⁸ India shows gross debt at 86.6 percent of GDP in 2021, lower than Brazil's 98.9 percent in 2020 but higher than Brazil's net debt at 62.7 percent that year..

⁹ Note, however, that the pre-pandemic baseline had been optimistic, showing a decline from a net-debt ratio of 41.4 percent in 2019.

Impact on the Ratio of Interest Payments to GDP

In contrast to the large rise in medium-term debt from the pre-pandemic baseline, there was little change in projected interest payments relative to GDP.¹⁰ As shown in table 4, the median ratio of interest payments to 2024 GDP rose only slightly, from 2.8 percent of GDP to 3.1 percent. Yet the proportionate rise of the debt ratio by 36 percent (16.2/61.2) could have implied an expected rise in the median interest burden from 2.8 percent of GDP to 3.8 percent. The presumptive explanation of the paradox is that the collapse of interest rates at the center of the global economy, and warranted departure from normal domestic monetary rules in light of the pandemic emergency, have facilitated a reduction in interest rates in the emerging markets that has been sufficient to offset the rise in the debt stock as well as the potential rise in the credit-risk component of interest rates that would have been expected. An important indication of the change in the policy environment was that several emerging market economies adopted quantitative easing for the first time.¹¹

For Brazil, the projected 2024 (net) debt ratio to GDP rose from 64.6 percent to 70.2 percent, a proportionate increase of 9 percent, yet the projected interest burden for 2024 has *fallen* from 6.8 percent of GDP to 5.62 percent, a proportionate *decline* of 17 percent. For the two other economies with the highest baseline ratios of interest payments to GDP, South Africa and India, the revised projection does show a rise in the interest burden as well as the debt burden. The proportionate rise in the interest burden is significantly smaller than that in the debt burden for India, but marginally larger for South Africa.¹² From a lower base, Colombia also shows a large increase in the interest burden, but again this increase is proportionately smaller than the increase in the debt ratio.¹³

¹⁰ In early 2021 Kamin (2021) emphasized the pattern of prospective stasis in emerging market interest burdens despite surges in their debt ratios, thanks to lower interest rates. His calculations found Turkey, South Africa, and Brazil to be outliers for which the interest burden would likely rise.

¹¹ The IMF (2020, table 2.1) found that 15 emerging market economies adopted asset purchases amounting to a median of 1.4 percent of GDP, reaching above 4 percent in two economies. Note, however, that although the Brazilian congress authorized asset purchases, the central bank decided not to pursue quantitative easing could undermine its credibility. Bryan Harris, "Brazil Central Bank Chief Resists Using New QE Powers," *Financial Times*, June 8, 2020.

¹² For India, the debt ratio rises from 65.6 percent to 87.3 percent, a proportionate increase of 33.1 percent; the interest ratio rises from 4.49 percent to 5.58 percent, a proportionate increase of 24.3 percent. For South Africa, an exception to the paradox, the projected debt ratio for 2024 only rises from 73.7 percent to 75 percent, a proportionate increase of 1.8 percent, whereas the interest ratio rises from 5.19 percent to 5.4 percent, a proportionate increase of 4 percent

¹³ Colombia's debt ratio for 2024 rises from 34.1 percent of GDP to 59.9 percent, a proportionate increase of 76 percent. Its interest ratio rises from 2.11 percent of GDP to 3.05 percent, a proportionate increase of 45 percent.

Table 4

General Government Interest Payments as Percent of GDP

	Baseline (a)				Revised (b)				Change 2024
	2019	2020	2021	2024	2019	2020	2021	2024	
BRZ	5.65	5.56	5.94	6.80	4.96	4.20	4.57	5.62	-1.18
CHL	0.39	0.48	0.54	0.60	0.35	0.52	0.43	0.70	0.09
COL	2.78	2.64	2.51	2.11	2.47	2.60	2.80	3.05	0.94
MEX	3.66	3.48	3.44	3.38	3.73	3.96	3.68	3.46	0.08
IND	5.00	4.79	4.67	4.49	4.65	5.37	5.57	5.58	1.09
INS	1.73	1.65	1.60	1.45	1.74	2.04	2.01	1.82	0.37
MLS	1.98	1.85	1.91	2.08	2.04	1.75	1.69	2.22	0.14
PHL	3.66	3.48	3.44	3.38	1.59	1.82	2.48	2.38	-1.00
THA	0.59	0.52	0.50	0.74	0.54	0.47	0.42	1.19	0.46
SAF	3.98	4.16	4.39	5.19	3.58	4.10	4.20	5.40	0.21
TUR	1.75	2.15	2.64	2.76	1.98	1.93	2.55	3.25	0.49
Median	2.78	2.64	2.64	2.76	2.04	2.04	2.55	3.05	0.29

a. Oct. 2019 WEO

b. Oct. 2021 WEO

c. Change in median. Median of changes: +0.21 percent.

Source: IMF (2019, 2021a)

Changes in 10-Year Interest Rates

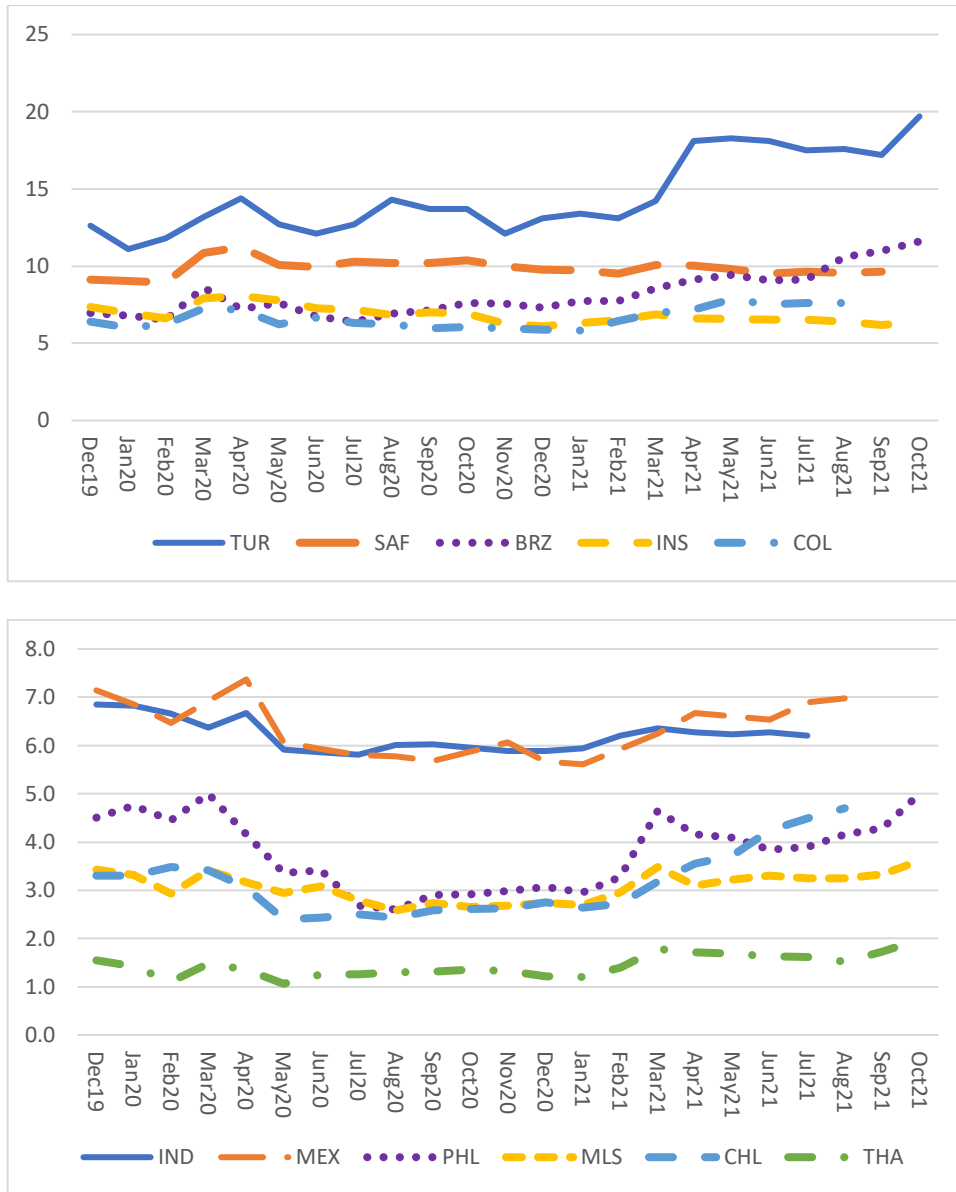
The paradox of relatively unchanged interest burdens despite substantially higher debt burdens in part reflects the decline in interest rates in the policy and financial market responses to the pandemic. As shown in Figure 2, although domestic-currency 10-year government bond rates for the EM11 countries initially surged at the outset of the pandemic in February-March 2020, they then declined substantially. Nonetheless, these rates do not show as strong a decline as might be expected from the stasis of prospective interest burdens despite rising debt. A decline from the pre-pandemic level of interest rates through early 2021 was most evident for India, Mexico, and the Philippines. In contrast, for Brazil, Colombia, and Turkey, for most of 2020 the rates were comparable to their level in December 2019-February 2020.

For most of the EM11 economies, after reaching a low point in January 2021 the 10-year rates rebounded substantially through September-October. By then the rates were higher than in January 2020 for eight of the eleven economies, with especially large increases in Turkey (by 860 basis points) and Brazil (by 480 basis points). The rebound likely reflected the surge in the US 10-year rate, from about 0.9 percent in January 2021 to about 1.6 percent in October.¹⁴ By implication, other influences must have cooperated to limit the rise in the prospective interest burdens so substantially behind the rise in prospective debt burdens. One such factor may have been a shift toward shorter-term debt in financing the larger deficits.

¹⁴ With fluctuation between a peak of 1.7 percent in early April to 1.25 percent in late July (FRED, 2021).

Figure 2

10-year Government Bond Rate (percent)



Source: FRED (2021); World Government Bonds (2021a)¹⁵

Changes in Real Interest Rates

A potential complication in interpreting the interest burden profiles is the difference between the current-year interest rate and the rate that prevailed when the average vintage of

¹⁵ Rates for Chile, Colombia, India, Mexico, and South Africa are from FRED (2021). All others are from World Government bonds (2021a).

debt was originally issued. Another complication is the difference between the real interest rate and the nominal interest rate. Other things being equal, it will be the real interest rate that matters for the evolving debt burden. Table 5 shows the average real and nominal 10-year government bond rates in 2018-2019 and 2020-21 for the EM11 as well as four G7 economies.¹⁶ The expected inflation used in the calculation is the WEO projection for 2019-24 in the first period and for 2020-26 in the second.

For the United States, the expected real rate fell from slightly positive in 2018-19 to a negative 1 percent in 2020-21, driven mainly by a decline in the nominal interest rate as the Federal Reserve cut the policy rate and adopted quantitative easing to deal with the Covid-19 recession. The decline between the two periods amounted to about 1.3 percent. Declines in the real rate were about one third as large in France and the UK, and the real rate *rose* by almost 60 basis points in Japan as expected inflation fell more than the 10-year rate.

Among the EM11, the largest declines in the expected real 10-year rate were by 263 basis points in the Philippines and 158 basis points in Mexico. In both cases inflation expectations remained flat but nominal 10-year rates fell sharply. The change in the median for the EM11 as a group was more modest but sizable, a decline of 48 basis points.¹⁷ However, the real rate rose sharply in South Africa (by 167 basis points) and significantly in Colombia (by 50 basis points). In terms of the level rather than the change, the median real 10-year rate for the EM11 in 2020-21 stood at almost 3 percent, or about 400 basis points above the median real rate of -1 percent for the four advanced economies shown in table 5. In principle a gap this wide would pose a meaningful incentive to capital flows to the emerging market economies.

¹⁶ For 2021 the average is for the first eight months.

¹⁷ A caveat is that the calculations do not cover the period after August 2021.

Table 5
Nominal and Real 10-year Government Bond Rates,
2018-19 and 2020-21 averages (percent)

	2018-19			2020-21			Change in real 10-yr rate
	expected inflation	nominal 10-yr rate	real 10-yr rate	expected inflation	nominal 10-yr rate	real 10-yr rate	
US	2.24	2.53	0.29	2.22	1.22	-1.00	-1.28
France	1.48	0.46	-1.02	1.24	-0.09	-1.33	-0.31
Japan	1.11	-0.02	-1.14	0.61	0.04	-0.57	0.56
UK	1.96	1.20	-0.76	1.74	0.55	-1.19	-0.43
Brazil	3.60	8.88	5.28	3.53	8.00	4.46	-0.81
Chile	2.83	4.04	1.21	1.91	3.07	1.16	-0.05
Colombia	3.24	6.75	3.51	2.65	6.65	4.00	0.50
Mexico	3.15	7.84	4.69	3.16	6.27	3.11	-1.58
India	3.93	7.35	3.41	4.44	6.18	1.74	-1.68
Indonesia	3.11	7.41	4.30	2.69	6.81	4.12	-0.18
Malaysia	2.02	3.87	1.84	1.55	3.04	1.48	-0.36
Philippines	2.81	6.13	3.31	3.00	3.68	0.68	-2.63
Thailand	1.40	2.18	0.78	1.13	1.42	0.29	-0.49
South Africa	5.13	9.10	3.97	4.29	9.93	5.64	1.67
Turkey	12.35	15.50	3.15	11.67	14.60	2.93	-0.22
EM11 median	3.15	7.35	3.41	3.00	6.27	2.93	-0.48 ^b

a. Projected average in 2019-24 for the first period and 2020-26 in the second

b. Change in EM11 median. Median of country changes: -0.36 percent.

Source: FRED (2021); World Government Bonds (2021a); IMF (2019; 2021a).

Capital Flows

The Institute of International Finance (IIF, 2021) provides estimates of portfolio capital flows from non-residents to emerging market economies (including China). These flows refer to portfolio debt (bonds) and equity (stocks), and thus exclude direct investment, loans from banks, and official sector loans.

Figure 3 shows the initial Covid-19 shock to these flows. Whereas they showed average net inflows of nearly \$30 billion monthly in September 2019 through January 2020, they fell to only \$3 billion in February and then plunged further to -\$83 billion in March 2020. The flows then recovered to an average of \$13 billion monthly in April through October 2020, and reached an average of \$38 billion monthly in November 2020 through June 2021. However, they fell again sharply in July and August of 2021, perhaps reflecting the rapid spread of the Delta variant of the virus.

Figure 3

Net Flows of Portfolio Capital from Non-Residents to Emerging Market Economies
(monthly, US\$ billions)



Source: IIF (2021)

The large initial shock to capital flows led to warnings of a new round of emerging market defaults and calls for officially-orchestrated standstills on capital outflows.¹⁸ In October

¹⁸ In April 2020, seven leading economists and lawyers called for creation of a Central Credit Facility at the World Bank or regional development banks where middle-income countries could request temporary relief “to deposit stayed interest” and defer principal payments (Bolton et al, 2020). In early October, Carmen Reinhart, the Chief Economist of the World Bank and a noted expert on historical financial crises, argued that developing countries should take on new debt to fight the economic impact of the pandemic but warned that they would likely later

2020 through June 2021 capital flows staged a meaningful recovery, as shown in figure 3, although by July and August they again showed weakness.

Figure 4 shows net capital flows to eleven major emerging market economies, as measured by the balance of payments “financial account”, a broader concept that includes direct investment as well as resident flows (including resident capital flight). The first observation is the average quarterly flow for 2019; the other observations are quarterly flows thereafter.

The economies shown in figure 4 all had declines in net capital inflows in early 2020, with a majority having declines in both the first and second quarters (Brazil, Chile, India, Malaysia, Philippines, South Africa), four having declines in the first quarter only (Colombia, Indonesia, Thailand, Turkey), and one having a decline from the 2019 quarterly average by the second quarter of 2020 (Mexico). Despite the recoveries, average net flows for 2020 as a whole were down sharply from 2019 for most of the economies. Against 2019 GDP (measured in US dollars), net flows fell from 2019 to 2020 by 0.6 percent of GDP in India; about 2 percent for Brazil and Mexico; about 3 percent for Colombia, Indonesia, and South Africa; and almost 5 percent for Chile. Turkey was the exception as net flows rose by 0.9 percent of GDP.¹⁹ The dominant pattern of falling capital inflows in part reflected less need for financing as current account deficits narrowed with recession-curbed imports.²⁰

A major consideration for the impact of capital flows on government debt sustainability is that *most emerging market economies now have relatively limited public debt denominated in foreign currency*. As a consequence, a decline in the exchange rate from risk-off reductions in capital inflows does not increase the burden of the debt by much. The Bank for International Settlements (BIS, 2021) reports that at the end of 2020, long-term (over one year maturity) general government debt owed in foreign currency was zero for India and Thailand, and very low in Malaysia (1.9 percent of GDP) and Brazil (3.2 percent). Foreign currency debt was modest in South Africa (6.2 percent of GDP), Mexico (7.5 percent), Chile (7.8 percent), and Indonesia (8.1 percent). The level was higher but moderate in the Philippines (9.7 percent of GDP), Colombia (11.6 percent), and Turkey (14.4 percent). Only Argentina showed a particularly high level (29.0 percent of GDP).²¹

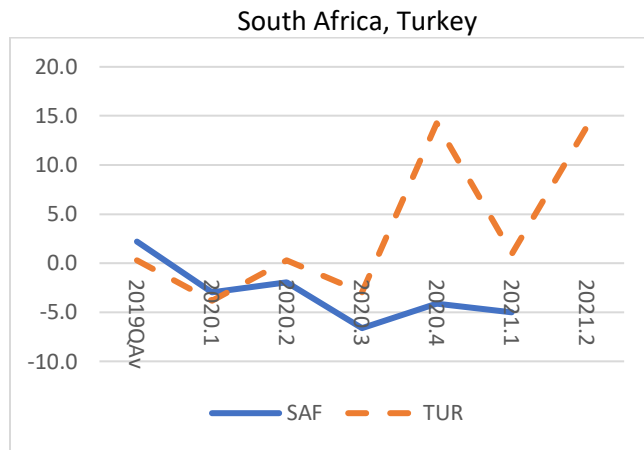
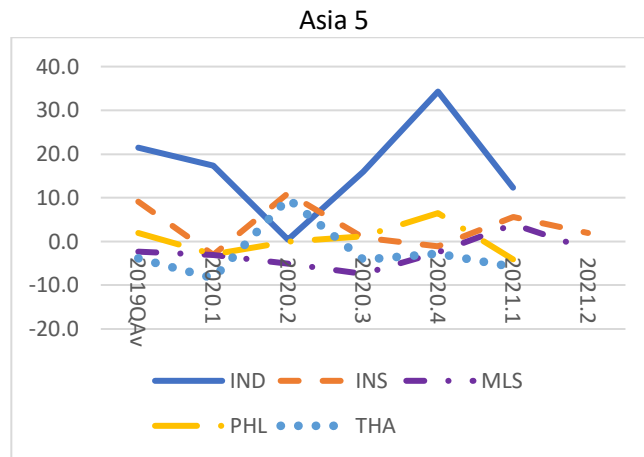
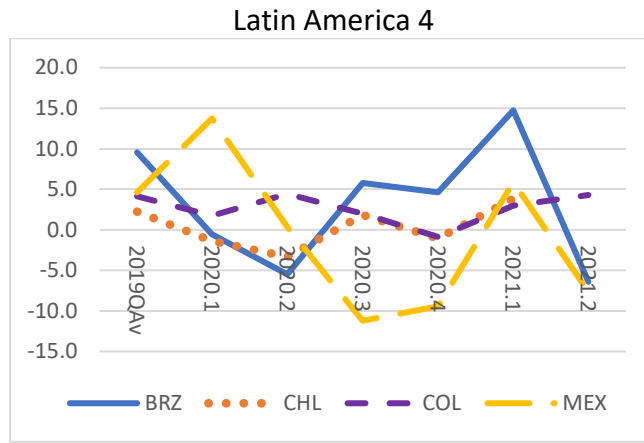
suffer an unprecedented wave of debt crises and restructurings. Jonathan Wheatley, “Borrow to Fight Economic Impact of Pandemic, Says World Bank’s Chief Economist,” *Financial Times*, October 8, 2020. The Chief Economist, Carmen Reinhart, is a noted expert on historical debt crises.

¹⁹ Both Malaysia and Thailand had shown net capital outflows in 2019, reflecting their large current account surpluses (about 3 percent and 7 percent of GDP respectively).

²⁰ Chile’s large drop in capital inflows reflected less need for finance as the current account swung from -3.7 percent of GDP in 2019 to +1.4 percent in 2020. Conversely, Turkey’s rise in external finance reflected a large decline in its current account balance, from +0.9 percent of GDP to -5.1 percent (IMF, 2021b).

²¹ Calculated applying the dollar value of GDP in 2020 as reported in IMF (2021a).

Figure 4
 Net Capital Flows to Major Emerging Market Economies
 (Quarterly, US\$ billions)



Source: IMF (2021b)

Larger foreign-currency government debts were owed by India (\$107 billion, or 4 percent of GDP, primarily owed to official institutions); Argentina (\$43.7 billion, or 11.3 percent of GDP); and Chile (\$37.9 billion in 2021:Q2, or 12.3 percent of GDP (BIS, 2021; Chile, 2021). For South Africa, the World Bank (2021a) places external debt owed by the government at \$76 billion. However, about \$55 billion of this total is in domestic-currency bonds held by foreigners (South Africa, 2021, 84). By implication, foreign currency debt is on the order of \$21 billion, or about 6 percent of GDP. Turkey’s government debt denominated in foreign currency amounted to \$137 billion in August, 2021, or 17 percent of GDP (Turkey, 2021; IMF, 2021a). Even for Turkey, with the largest currency exposure, a major depreciation (such as 20 percent) would cause only a limited increase in the debt burden (in this example, by 3.4 percent).

Maturity Structure

A potential vulnerability in sovereign debt is a short maturity structure of existing debt, because of the increased risk of inability to roll over large amortizations coming due at interest rates as low as those paid before. Thus, the East Asian debt crisis of the late 1990s was triggered by high levels of short-term external debt that became difficult to renew (Cline, 2013). Table 6 reports the maturity structures of central government debt in the EM11 countries. The first column indicates the average maturity of debt obligations when issued; the second column shows the average remaining maturity of all debts.

Table 6

Average Maturities of Central Government Debt (years)

	Original	Remaining
ARG	9.1	6.4
BRZ	...	3.4
CHL	12	7.2
COL	14.6	7.8
MEX	...	7.8
IND	11.3	6.78
INS	14	8
MLS	12.8	8
PHL	9.4	5.5
THA	18.4	12
SAF	13.5	8.1
TUR	5.4	3.2

Source: BIS (2021); Chile (2021); India (2021); Turkey (2021)

Turkey and Brazil are notable for short maturity structures, with only 3 years residual maturity. The other economies typically have residual maturities of 6 to 8 years. Thailand has the longest, at 12 years, with average maturities of original issues at 18 years. The short structure for Brazil and Turkey flags vulnerability. Although South Africa has a relatively long average residual maturity of 8 years, as shown in table 5 its expected real interest rate is very high, at 5.6 percent for 10-year obligations. A long maturity becomes less of an advantage and more of a burden if the real interest rates on the stock of debt are high.

Real Debt Service Ratio

As a supplement to the usual metric of the debt-to-GDP ratio, and to the interest-to-GDP ratio (tables 3 and 4 above), it is useful to consider the “Real Debt Service Ratio” (RDSR) proposed in Cline (2021a,b). In an environment with substantially lower interest rates than in past decades, in principle the burden of any given ratio of debt to GDP would be expected to be lower than in the past. Moreover, the ratio of interest payments to GDP will tend to overstate the debt burden when nominal interest rates primarily reflect high inflation.

In the developing country debt crises of the 1980s and 1990s, the “external debt service ratio” was the principal metric for examining debt sustainability. This ratio compared the annual flow of interest plus amortization payments owed on external debt, to the level of exports, a measure of the country’s ability to mobilize the foreign exchange earnings needed. In contrast to this “external transfer” concern, in the 2020s the debt burdens of emerging market economies are much closer in nature to those involving the government’s ability to mobilize the “internal transfer” payments to service its debt primarily owed to its own citizens. The euro-area Maastricht criteria for acceptable levels of debt and deficits are illustrative of rules designed to meet the internal transfer problem, and as noted above, debt owed in foreign currency is now a small part of emerging market government debt.

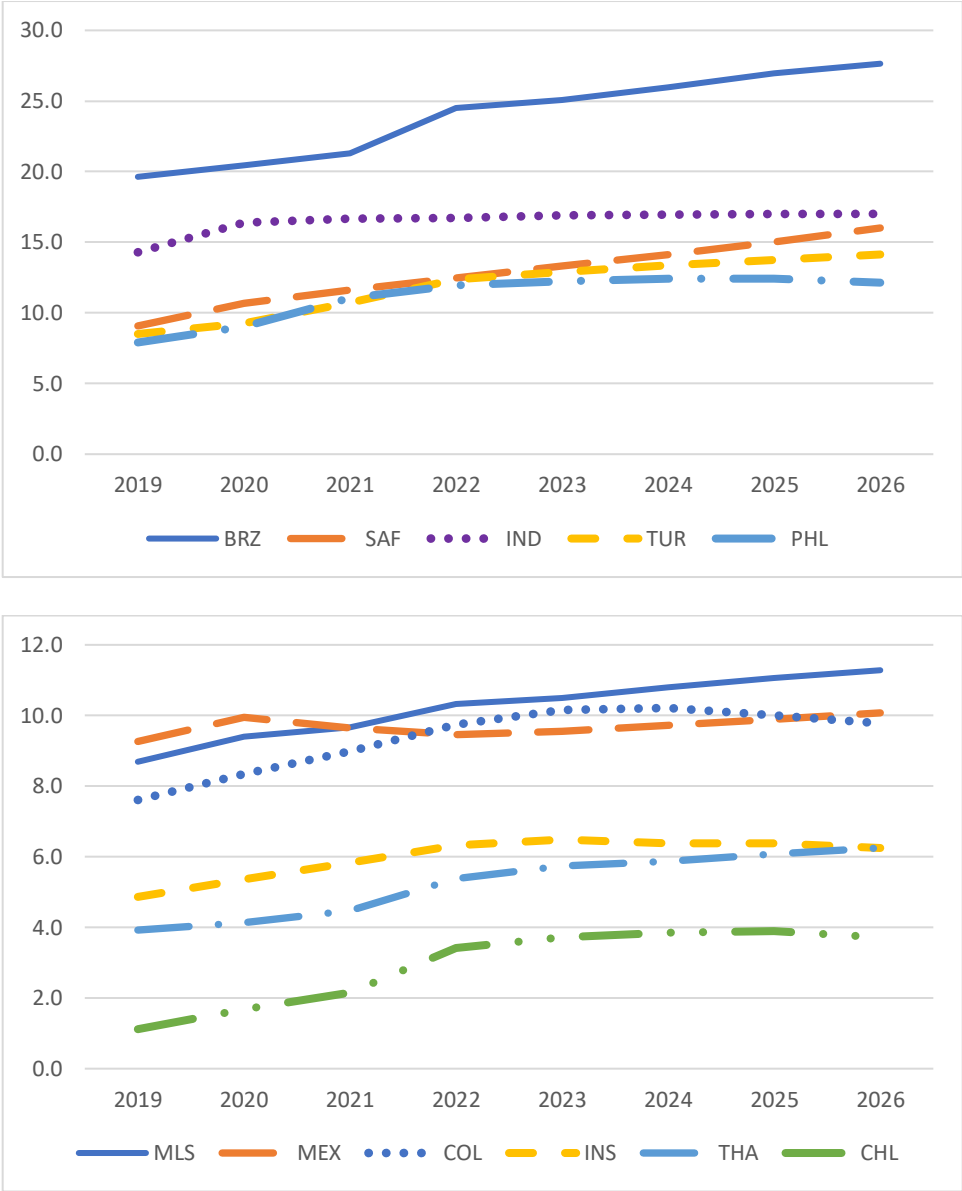
The “transfer” concern suggests it is necessary to consider the flow of principal repayments as well as either the debt stock or the interest payments alone. There is no guarantee that principal repaid can easily be rolled over in new debt at the same interest rate. A higher ratio of debt service to GDP can pose the risk of a non-linear escalation in interest rates as the credit-risk premium rises.

Figure 5 shows the medium-term path of the RDSR for the EM11 countries. The WEO projections of the IMF (2021a) provide the basis for these calculations. The denominator of the RDSR, the real GDP base, is the projected nominal GDP divided by the projected GDP deflator. The corresponding real interest payments are nominal interest payments divided by the projected consumer price index. Nominal amortization is projected by dividing nominal debt at the end of the previous year by the number of years of average remaining maturity (shown in table 6). Real amortization is the nominal magnitude divided by the projected consumer price index. The price indexes are normalized to a base of 100 for the base year, 2019. The data on government debt apply the net debt concept, by implication assuming that the maturity

structure of government assets is the same as that of government liabilities. For the four economies not providing data on net debt (India, Malaysia, Philippines, Thailand), gross debt is applied (as in table 3 above).

Figure 5

Real Debt Service Ratios:
Real Interest plus Amortization as percent of Real GDP



Source: Author's calculations. See text.

The RDSR metric places Brazil in a class by itself, with a real debt service ratio rising from about 20 percent of GDP in 2019 and 2020 to about 21 percent in 2021 and 28 percent by 2026. A second tier includes India, South Africa, and Turkey. India's RDSR rose from about 14 percent of GDP in 2019 to about 16 percent in 2020, but shows minimal further increase thereafter. The ratios for South Africa and Turkey rise substantially, from about 9 percent of GDP in 2019 to about 14-16 percent by 2026, with Turkey slightly lower than South Africa. A third tier comprises the Philippines, Malaysia, Mexico, and Colombia, all of which rise modestly from a range of 8-9 percent in 2019 to 10-12 percent by 2026. A fourth tier includes Indonesia and Thailand, showing a rise of the RDSR from about 4-5 percent of GDP in 2019 to about 6 percent by 2026. At the low end, Chile is in a class by itself, with a rise from only 1.1 percent of GDP in 2019 to a still low 3.6 percent by 2026.

Country Risk Premia and Ratings

Financial markets provide a metric for concern about debt sustainability: the credit default swap (CDS) rate. Traded in the over-the-counter market, CDS financial derivatives typically pay the buyer the full face value of the principal owed on the underlying obligation if the debtor defaults (or has another credit event such as bankruptcy or failure to pay).²² In the euro area debt crisis, in 2011-12 CDS rates reached 500 basis points in Italy and Spain, and 2500 basis points in Greece (the only euro-area country that defaulted).²³ If the loss-given-default rate is 50 percent, then a 1000 basis point (or 10 percent) CDS rate implies that the perceived probability of a default over the course of the year is 20 percent.

As shown in figure 6, there was a spike in CDS rates for the EM11 economies at the outset of the pandemic. The largest rise was for Turkey, from 250 basis points to 550 basis points in March 2020. The rate eased to 300 basis points by February 2021, but by April through October was back up to a plateau of about 400 basis points.²⁴ Among the eleven economies, recent CDS data are readily available (from World Government Bonds, 2021) for only four: Brazil, Mexico, Turkey, and Indonesia (first panel). For six other economies (second panel), data from that source are available but only through September 2020.

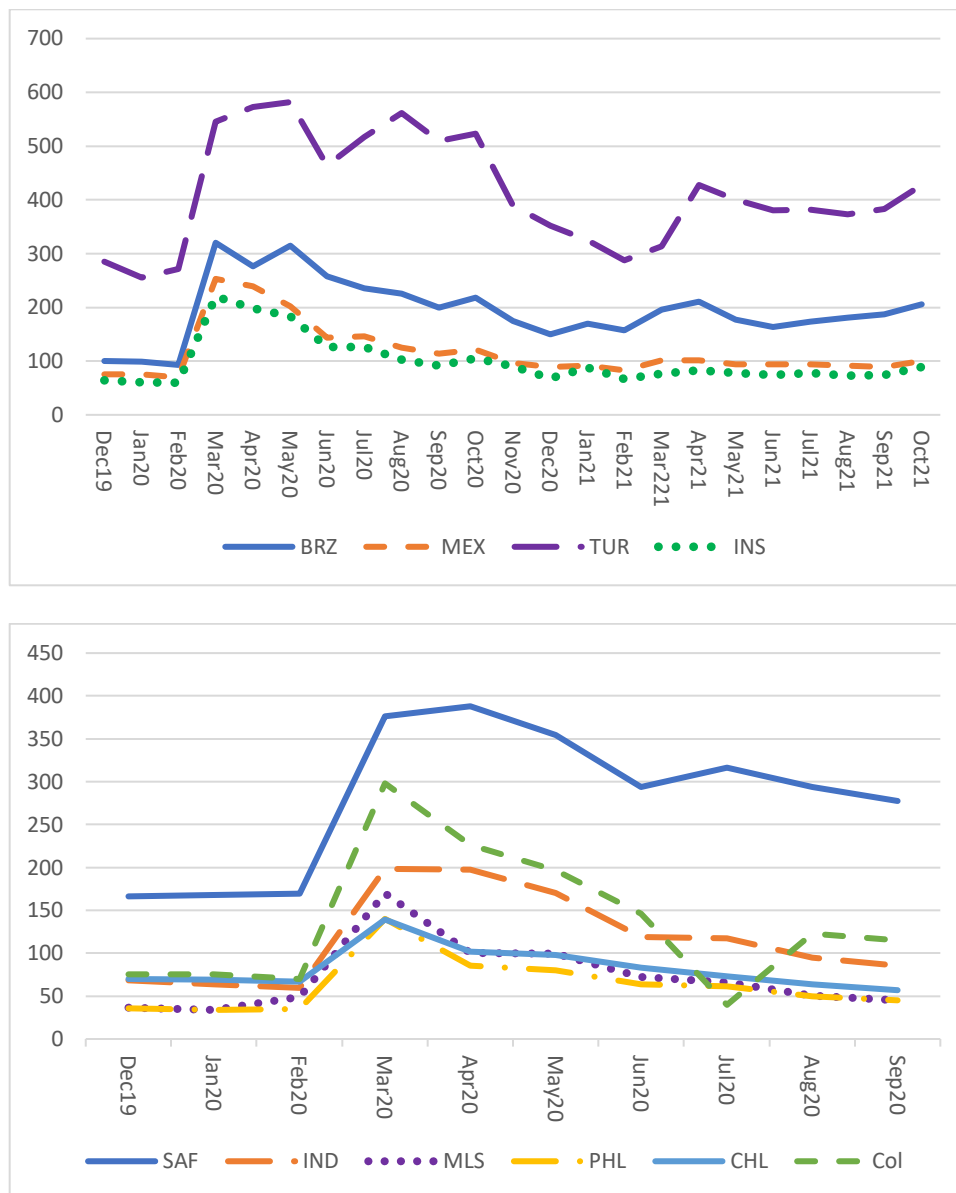
²² Most CDS contracts involve an ongoing premium payment by the purchaser, similar to the premium on an insurance policy. The CDS is "customized between the two counterparties involved," making the derivative "opaque, illiquid, and hard to track for regulators" (Hayes, 2021). The purchaser of the CDS transfers the default risk on the underlying obligation, but incurs counter-party credit risk. Hayes observes that Lehman Brothers, Bear Stearns, and AIG defaulted on their CDS obligations in the 2008 credit crisis.

²³ Cline (2014, p. 71).

²⁴ The partial decline in the CDS rate by 2021 in contrast to a sizable rise in the 10-year bond rate (figure 2) implies that for Turkey, by the second quarter of 2021 the force behind rising interest rates was an increase in expected inflation rather than sovereign risk.

Figure 6

Five-Year Credit-Default Swap Rates (basis points)



Source: World Government Bonds (2021b)

For Brazil (first panel), in early 2020 the CDS rate surged from about 100 basis points in January-February to about 300 basis points in March-June. Although the rate eased to about 150 basis points by December 2020, by October 2021 it had returned to about 200 basis points.

For Mexico and Indonesia, by January 2021 the rates were back relatively close to their January 2020 levels. Among the six economies in the second panel, rates had also declined back close to January 2020 levels as early as September 2020 for the Philippines, Chile, Malaysia, and India, but not for Colombia and South Africa. The available CDS rate data thus suggest potential lingering difficulties primarily for Turkey, Brazil, South Africa, and to a lesser degree Colombia.

Table 7 shows the sovereign risk credit ratings reported for the EM11 by Fitch and Standard & Poor's. Of the eleven economies, six have investment grade ratings from both agencies (BBB- or better). Colombia is ranked investment grade by S&P but not by Fitch. Turkey, South Africa, and Brazil are all ranked below investment grade. As shown in the table, the most recently available credit default swap rates have the same rank ordering as the ratings.

Table 7

CDS Rates and Sovereign Ratings as of August 2021:
Long-Term Local Currency Bonds

	CDS (bp)		S&P	review date	Fitch	review date
Turkey	378	a	BB-	5/28/21	BB-	2/19/21
South Africa	314	b	BB	5/21/21	BB-	5/21/21
Brazil	183	a	BB-	6/2/21	BB-	11/18/20
Colombia	148	b	BBB-	5/19/21	BB+	7/1/21
India	109	b	BBB-	7/13/21	BBB-	4/22/21
Mexico	95	a	BBB+	6/15/21	BBB-	5/17/21
Indonesia	79	a	BBB	4/22/21	BBB	5/22/21
Chile	67	b	A+	3/24/21	A-	c
Philippines	57	b	BBB+	5/27/21	BBB	5/27/21
Malaysia	57	b	A	6/22/21	BBB+	7/18/21
Thailand	n.a.		A-	11/18/20	BBB	6/18/21

a. Week of 8/9/21

b. Week of 9/28/20

c. 2021

Source: S&P (2021), Fitch (2021)

Principal Higher-Risk Economies

Table 8 presents an overview of the extent of deterioration in debt sustainability metrics for the EM11 from pre-pandemic levels. The first criterion is whether the ratio of net public debt to GDP has increased by 10 percentage points or more. This test uses the change in the IMF-projected baseline for 2024 from the October 2019 WEO to the October 2021 WEO, the final column of table 3. Six of the eleven economies meet this test for substantial deterioration. The second criterion is the ratio of interest payments to GDP. This test is again the change in the 2024 outlook from the pre-pandemic baseline, the final column of table 4. Using a threshold of 0.5 percent of GDP increase, only two economies meet this test (Colombia and India), whereas 7 economies show increases that are smaller than this threshold, and 2 economies show an improvement (reduction) rather than deterioration on this metric (Brazil and the Philippines).

The third criterion shown in table 8 is the change in the real 10-year interest rate from January 2020 to October 2021 or the most recent month available. A threshold of 0.5 percentage point is used for this test. On the basis of table 5, only two economies meet this test for deterioration: Colombia and South Africa. One economy shows a smaller increase (Indonesia), and the other 8 economies show improvements (decline in the real rate) rather than deteriorations. The fourth criterion is the Real Debt Service Ratio. Using a threshold of an increase of 5 percent of GDP, three economies show a substantial deterioration from 2019 to the level calculated from WEO projections for 2026 (Brazil, South Africa, and Turkey). None of the other 8 economies shows a deterioration meeting this test.

The fifth criterion in table 8 is the CDS rate. Using a threshold increase of 80 basis points for this test, only three economies show a substantial deterioration from January 2020 to October 2021 (Brazil, Turkey) or September 2020 (South Africa), whichever is the later date with data available. The final criterion is the sovereign risk rating. If an economy is at below-investment grade, and if its rating is at least one step in grade lower at present than in January 2020, this test shows a substantial deterioration. Only Colombia and South Africa meet this downgrade test.²⁵

The final column of table 8 summarizes the alternative tests with a count of “yes” instances on substantial deterioration under each criterion. South Africa and Colombia show the most severe outcome, meeting the test on four of the six of the criteria. Next are three economies meeting two of the six tests for substantial deterioration: Brazil, India, and Turkey.

²⁵ Fitch ratings are used for this test. They show Colombia transiting from BBB- to BB+, and South Africa, from BB+ to BB-.

Table 8

Substantial Deteriorations in Debt Sustainability by Alternative Criteria

	Net Debt/GDP	Interest/GDP	Real Int. Rate	RDSR ^a	CDS Rate	Rating	Sum
BRZ	No	Improve	Improve	Yes	Yes	No	2
CHL	No	No	Improve	No	Improve	No	0
COL	Yes	Yes	Yes	No	No	Yes	4
MEX	Yes	No	Improve	No	No	No	1
IND	Yes	Yes	Improve	No	No	No	2
INS	Yes	No	No	No	No	No	1
MLS	Yes	No	Improve	No	No	No	1
PHL	Yes	Improve	Improve	No	No	No	1
THA	No	No	Improve	No	...	No	0
SAF	No	No	Yes	Yes	Yes	Yes	4
TUR	No	No	Improve	Yes	Yes	No	2
threshold change:	10%	0.5%	0.5%	5%	80 bp	1 step	

a. Real Debt Service Ratio

Source: author's calculations. See text.

Sensitivity to Interest Rate Shock

Table 8 suggests special attention to five of the eleven major EMEs: Brazil, South Africa, Turkey, Colombia, and India.²⁶ These five also have the highest credit default swap rates and lowest sovereign ratings among the eleven economies (table 7). The following test for sensitivity to an interest rate shock focuses on these five.

For the United States, the IMF (2021g) projects the average real interest rate on 10-year government bonds during 2022-25 at only 0.18 percent.²⁷ The average ex-post realized real rate over the past six decades for the US was 2.69 percent (Cline, 2021a, 7). A meaningful stress test is to impose a 200 basis-point increase above baseline for the interest rates on new government debt for the five EME economies in the test.

Appendix A sets forth the method for conducting an “accounting-based” sensitivity test for higher interest rates. The calculation is accounting in the sense that it does not attempt to model induced changes in growth or inflation. Higher interest rates with unchanged primary balances raise debt and the amount of new borrowing required, in comparison with the baselines through 2026 estimated in IMF projections. The test examines three metrics of debt sustainability: the ratio of debt to GDP; the ratio of interest payments to GDP; and the ratio of real interest plus real amortization to real GDP, or the “Real Debt Service Ratio” (RSDR) discussed above. The RSDR measures the exposure of the economy to rollover borrowing requirements if the primary deficit is zero.

The calculations give special attention to the term structure of the debt. An increase in the interest rate in a given year only affects the new debt borrowed in that year, and does not show up in higher interest payments until the next year and thereafter. The interest shock affects the path of interest payments over 2023-26 as a consequence of the increased interest rate that must be paid on each vintage of new borrowing in 2022 through 2025 in the shock scenario.

The estimates also give additional attention to an alternative measure of each year’s borrowing needs. The estimates in figure 5 above assume that each year, the fraction $1/m$ of the previous year-end debt must be paid off in amortization, where m is average remaining maturity. As shown in table 6, this approach gives much higher amortization rates for Brazil

²⁶ Although table 8 focuses on *changes* in debt indicators following the Covid-19 shock, the prospective *levels* of debt indicators also suggest special attention to these five economies. Projections for 2024 place South Africa, Brazil, and Colombia at the highest levels of net debt to GDP among the countries with that measure available, and India’s gross debt measure is so high that its net level is likely comparable (table 3). Similarly, Brazil, South Africa, and India have the highest 2024 ratios of interest to GDP (all at about 5.5 percent of GDP), although Colombia’s level is considerably lower (table 4). Turkey is the anomaly, with lower debt and interest burden indicators, but the highest CDS rate of all (figure 6).

²⁷ Deflating by the personal consumption expenditure (PCE) index.

and Turkey, with remaining maturities of only about 3 years, than to most other major EMEs, whose remaining maturities tend to be in the range of 6 to 8 years. The IMF Article IV reports provide an alternative basis for calculating amortization, by reporting the baseline “gross financing needs” (GFN). Amortization can be inferred from the GFN given the fiscal deficit.²⁸ The calculations described in Appendix A use the average of the amortization rates obtained by the two alternative approaches: remaining maturity and GFN-based.

Figure 7 reports the impact of a 200 basis-point shock to interest rates for the five EMEs beginning in 2022. The baseline path for the variable is indicated by the country’s abbreviation followed by “bas”; the interest-rate-shock path is similarly identified with “irs”. The first panel shows the two paths for the ratio of debt to GDP; the second panel, the interest-to-GDP ratio; and the third panel, the paths for the RDSR.

For the ratio of *debt to GDP*, the largest change is for Brazil. Its baseline net debt rises from 60.7 percent of GDP in 2021 to 73.3 percent in 2026. The interest shock boosts the ratio to 77.1 percent by 2026, an increase of 3.9 percentage points of GDP. The corresponding increases by 2026 are 2.7 percent of GDP for South Africa, 2.6 percent for India, 1.9 percent for Turkey, and 1.5 percent for Colombia. That the largest increase is for Brazil reflects Brazil’s short maturity structure and hence its need to borrow larger amounts at the higher interest rates. Although Turkey also has a short maturity structure, the path of its debt ratio is considerably lower in the baseline so the increase is correspondingly more moderate.

India’s debt ratio declines over the period in the baseline and continues to do so albeit by less in the interest shock scenario. Because net debt data are not available for India, its initial debt ratio of 90 percent refers to gross debt, and is overstated compared to the net debt ratio used for the other economies. It is not clear how large the overstatement is, however.²⁹ From another standpoint, a relatively high debt ratio for India no longer warrants as much interpretive amelioration as in the past on grounds that it has relatively high erosion of debt from higher inflation. Its inflation is now close to the median for major EMEs.³⁰

The second panel of figure 7 reports the baseline and interest-shock paths for a second metric: the ratio of *interest payments* to GDP. Brazil again provides among the more substantial changes. Whereas its baseline interest ratio falls from a peak of 6.7 percent of GDP in 2022 to 5.6 percent by 2026, in the interest-rate-shock (irs) simulation it reaches 7.2 percent of GDP by 2026.

²⁸ The change in net debt equals the fiscal deficit. New borrowing, which is the gross financing need, equals the deficit plus amortization. So amortization equals the GFN minus the fiscal deficit.

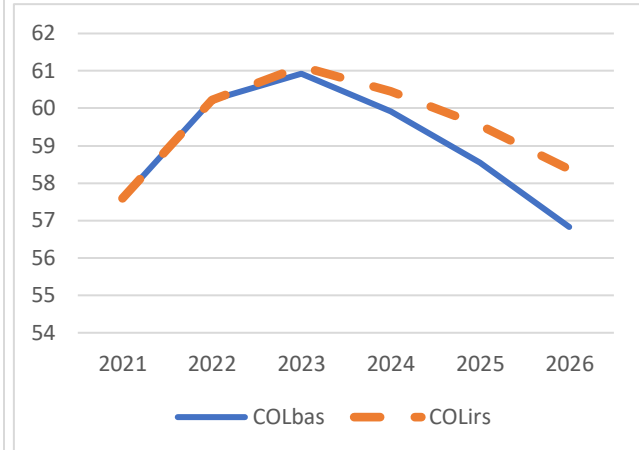
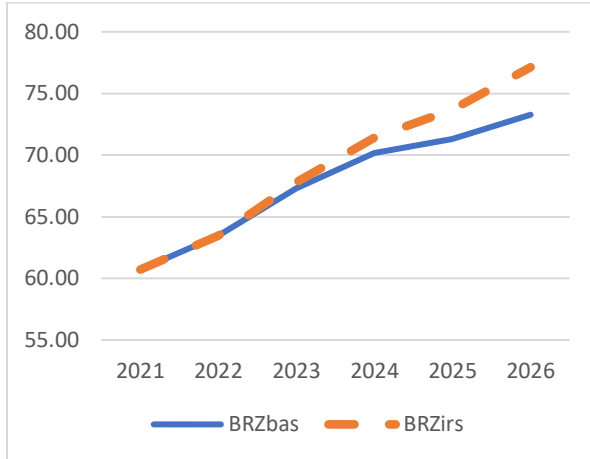
²⁹ In 2020, India’s external reserves amounted to 20.6 percent of GDP, so net debt may be less than gross debt by that magnitude or more. IMF (2021a,b).

³⁰ In 2006-2015 India’s average inflation was 8.4 percent annually; for 2016-2025 the average rate is estimated at 4.5 percent. In comparison, median inflation among the EME11 considered in this study was 4.0 percent in the first period and is estimated at 3.7 percent in the second. (IMF, 2021a).

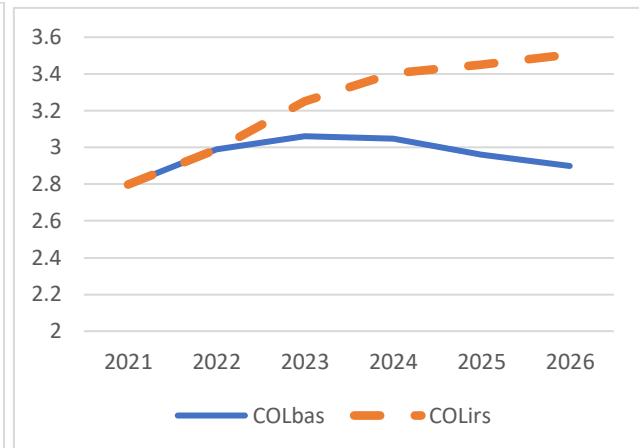
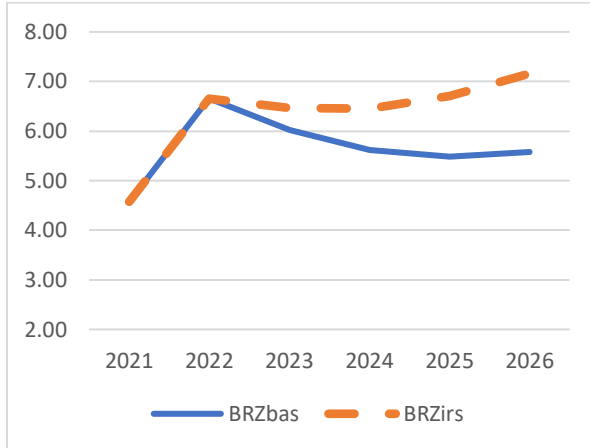
Figure 7

Debt Indicators for Brazil, Colombia, India, South Africa, and Turkey:
Baseline and with Interest Rate Shock

Net Debt to GDP Ratio (percent)



Interest to GDP Ratio (percent)



Real Debt Service to Real GDP Ratio (percent)

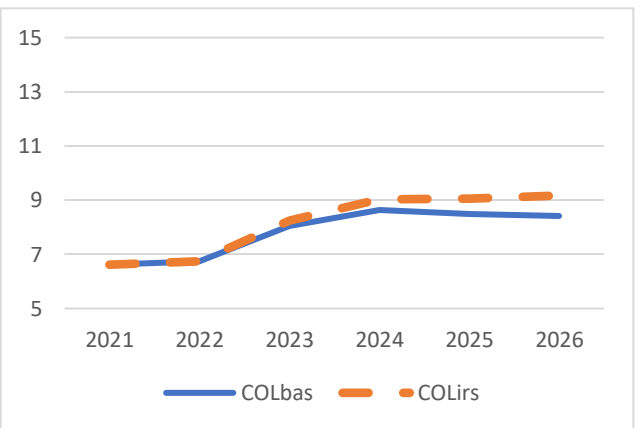
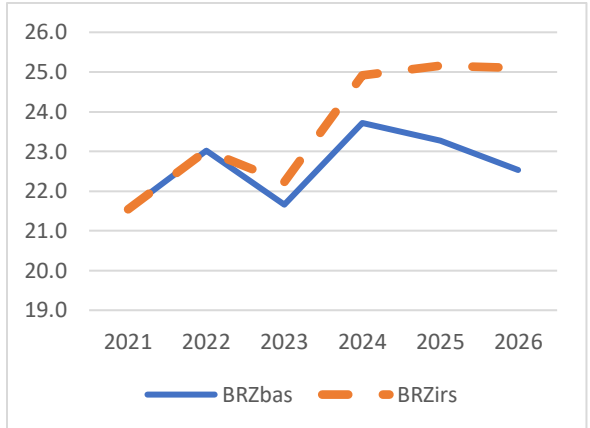
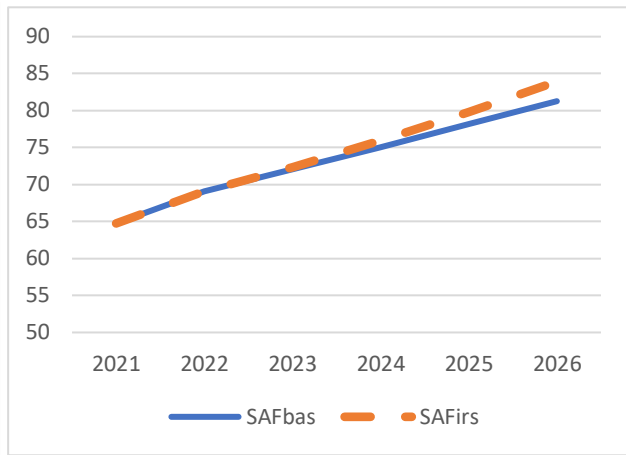
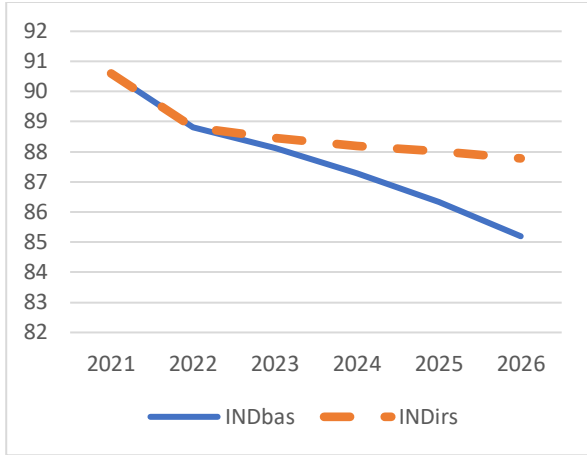
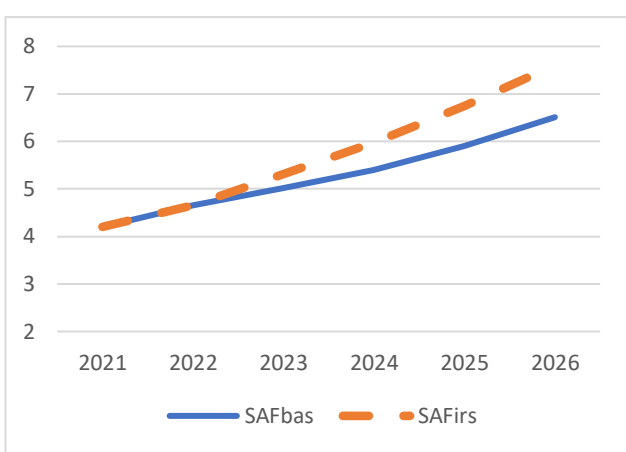
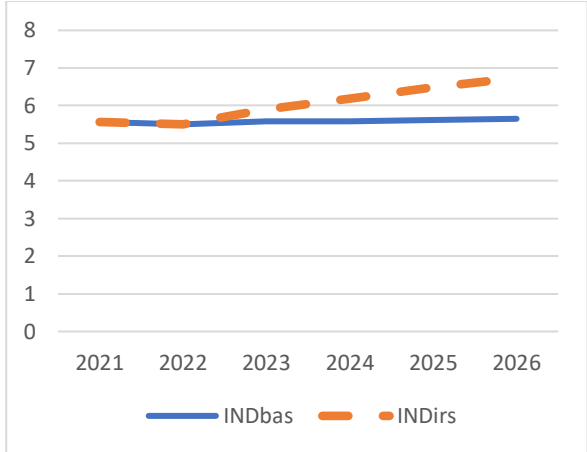


Figure 7, continued

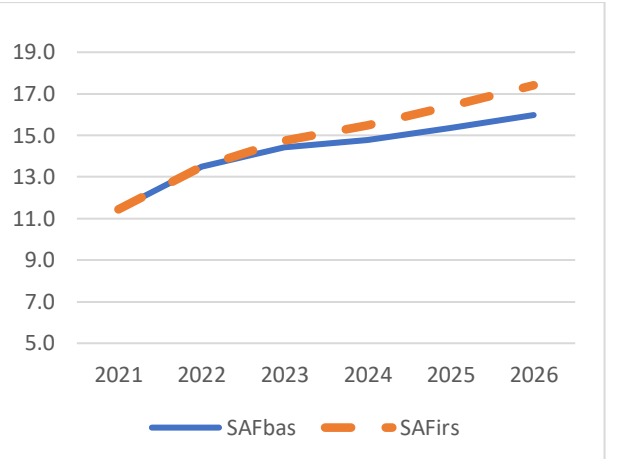
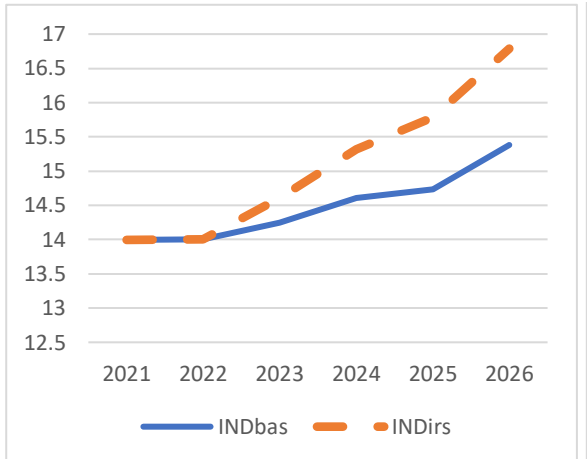
Net Debt to GDP Ratio (percent)^a



Interest to GDP Ratio (percent)

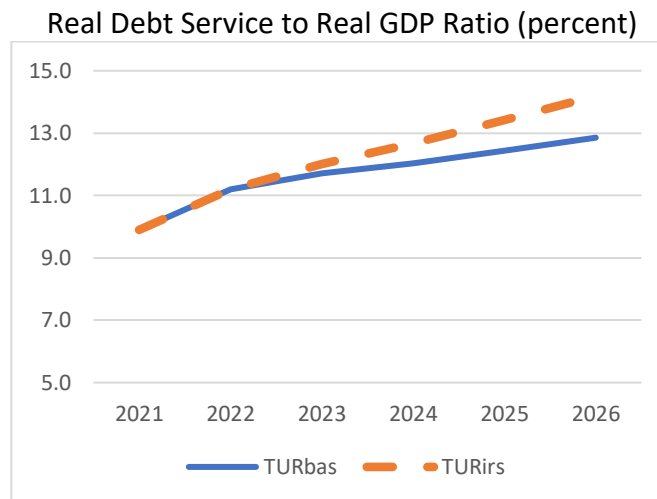
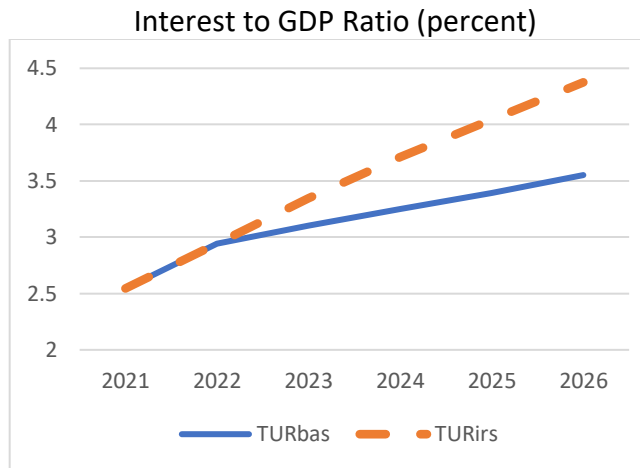
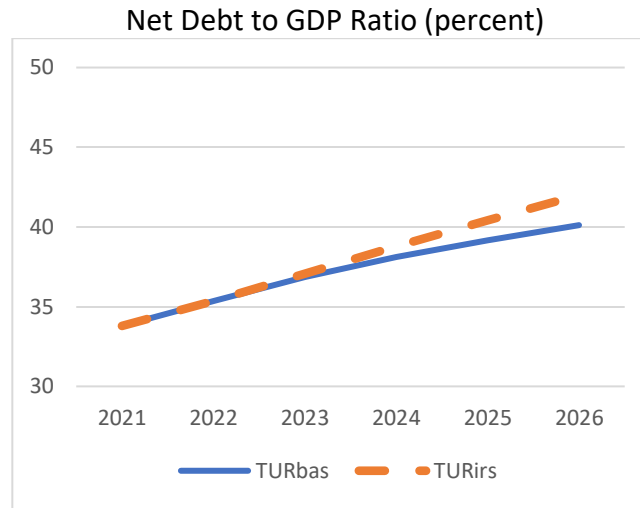


Real Debt Service to Real GDP Ratio (percent)



^a India: Gross Debt

Figure 7, concluded



Source: IMF (2021a,c,d,e,f); author's calculations

In the shock scenario the interest payments also reach high levels of 7.6 percent of GDP for South Africa and 6.7 percent for India. Turkey's interest ratio reaches 4.4 percent rather than the 3.5 percent in its 2026 baseline; and Colombia rises to 3.5 percent rather than easing back to 2.9 percent in its baseline. The increment from baseline in the 2026 interest to GDP ratio is the highest for Brazil (1.59 percent of GDP), followed by South Africa (1.09 percent) and India (1.08 percent). The increments are lower for Turkey (0.83 percent of GDP) and Colombia (0.61 percent), reflecting lower debt ratios and despite Turkey's short maturity structure.

The third metric, the *Real Debt Service Ratio*, shows an intermediate degree of sensitivity to the shock between the mild and large proportionate shocks in the debt and interest ratios respectively. Brazil's RDSR rises from about 22 percent of GDP in 2021 to about 25 percent 2026 in the interest-rate-shock scenario instead of being back at about 22 percent by 2026 in the baseline.³¹ South Africa's RDSR rises from about 11 percent in 2021 to 16 percent in the baseline but 17.4 percent in the interest rate shock. By 2026, the shock boosts the RDSR above baseline by 1.4 percent of GDP for both India and Turkey, but by only 0.8 percent for Colombia, in view of its considerably lower starting point as well as its lower amortization rate.³²

Of the three metrics, the interest/GDP ratio shows the largest impact of the interest shock, with its 2026 level reaching about one fifth higher than in the baseline. In contrast, this increase is about one tenth for the RDSR, and one twenty-fifth for the ratio of debt to GDP. Greater sensitivity of the interest ratio reflects not only the fact that the interest rate is the instrument of the shock but also the fact that the 200 basis point shock is large relative to the baseline interest rate. Thus, the median 10-year nominal rate in 2020-21 for these five economies was 8 percent (table 5). For its part, the RDSR incorporates both interest and the amortization of existing debt, and hence has a sensitivity that is intermediate between that of the interest ratio and the debt ratio.

For at least 3 of the economies, real 10-year rates on government bonds were already high in 2020-21: South Africa (5.6 percent); Brazil (4.5 percent); and Colombia (4.0 percent; table 5). These high initial real rates suggest special vulnerability to still further rate increases.

A distinctive feature of the projections is the paradox that Turkey tends to fare more favorably on the various metrics (for example, with the lowest path of all five economies for the ratio of debt to GDP), yet it has by far the highest credit default swap rate (figure 6) and is tied with Brazil for the lowest credit rating (table 7). One reason may be that Turkey is unique in maintaining double-digit inflation rates, increasing uncertainty. Another may be greater concern about Turkey's political stability than about that of most other major EMEs. Thus, one

³¹ The 2026 baseline for Brazil in the estimates of figure 5 places the RSDR at 28 percent, about six percentage points higher. The difference stems from the lower amortization rate implied by the GFN-based alternative, which in the estimates of figure 7 is averaged together with the remaining-maturity amortization rate used in figure 5.

³² Already low in the lengthy remaining-maturity measure (at 1/7.8 years, or 12.8 percent), the amortization rate is even lower in the GFN-based alternative measure, at 6.4 percent over 2022-2026, placing the combined rate used in figure at 9.6 percent.

private-sector index of political stability, using a scale from -2.5 for weak to +2.5 for strong, placed the average during 2016-20 at -0.23 for South Africa, -0.48 for Brazil, -0.81 for Colombia, and -0.87 for India, but -1.54 for Turkey (Willis Towers Watson, 2021).³³

Turkey's special macroeconomic fragility and external sector vulnerability became conspicuous in December, 2021. The Turkish currency fell from an average of 9.2 lira per US dollar in October (BIS, 2021b) to a low of 18 per dollar by late December after President Erdogan ordered a series of interest rate cuts despite high inflation.³⁴ The rate rebounded to 12 per dollar only after the government announced a program compensating Turkish savings depositors for future exchange rate losses.

Primary Deficits

The path of primary fiscal balances is central to debt sustainability. As shown in figure 8, there were sharp deteriorations in primary balances in the pandemic in four of the five major EMEs with relatively more challenging debt sustainability outlooks. The sharpest fall in the primary balance was in Brazil, where the primary deficit reached 9.2 percent of GDP in 2020. The surge of the primary deficit in Brazil reflected the country's large "additional spending and foregone revenue" carried out to address the Covid-19 pandemic. The IMF estimates that for Brazil this expenditure during 2020 and 2021 through September amounted to 9.8 percent of 2020 GDP (IMF, 2021k). The corresponding Covid-19 expenditures were 5.2 percent of 2020 GDP for all EMEs; 5.6 percent in South Africa, 5.0 percent in Colombia, 4.4 percent in India, and 3.6 percent in Turkey.

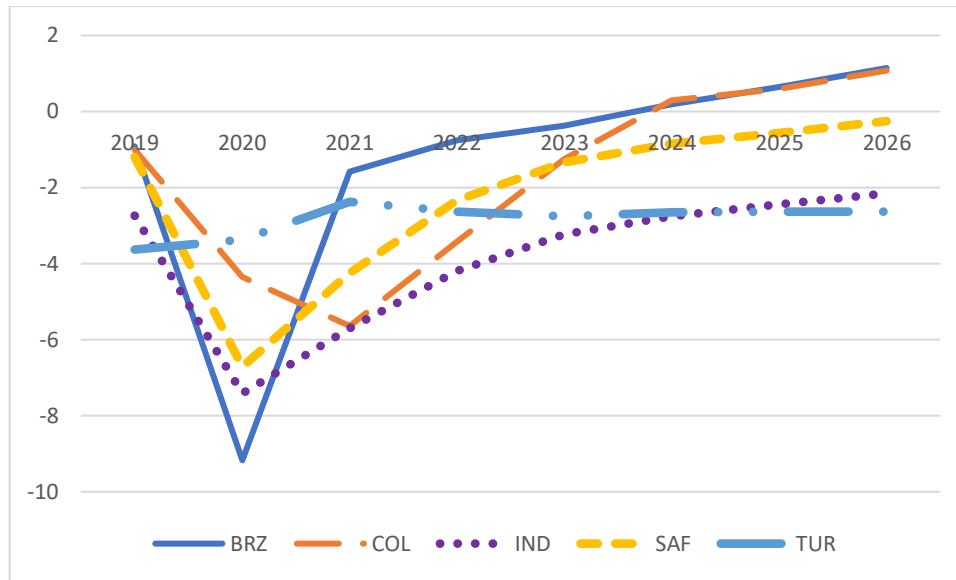
The WEO baseline projects adjustment in the primary deficit for four of the five economies, but not for Turkey. The expected adjustment will bring the primary balance to a surplus of about 1.1 percent of GDP by 2026 for both Brazil and Colombia; a small deficit of 0.25 percent of GDP for South Africa; but a deficit of 2.2 percent of GDP for India and 2.6 percent for Turkey (IMF, 2021a). In comparison, the average primary balance outcomes for these economies in 2011-2019 were -0.3 percent of GDP for Brazil and Colombia, -1.1 percent for South Africa, -0.4 percent for Turkey, and -2.6 percent for India. The baseline thus calls for primary balance adjustment by 2026 against the 2011-19 record amounting to 1.4 percent of GDP for Brazil and Colombia, 0.4 percent for India, approximately zero for South Africa, and negative adjustment amounting to 2.2 percent of GDP for Turkey. The comparisons suggest the projections may be on the optimistic side for Brazil and Colombia, and they provide additional information on why Turkey faces more adverse ratings and credit default swap rates than might be anticipated from its ratio of debt to GDP.

³³ The same source cites "low and rapidly declining foreign exchange reserves and high external financing requirements" for Turkey.

³⁴ Laura Pitel and Tommy Stubbington, "Turkey's Currency Surges after Erdogan Unveils Lira Savings Scheme," *Financial Times*, December 21, 2021.

Figure 8

Primary Deficits as Percent of GDP: IMF Baselines for Brazil, Colombia, India, South Africa, and Turkey



Source: IMF (2021a)

International Policies

International policy initiatives to address developing country debt stress from the Covid-19 shock have focused on the low-income countries. In May, 2020, the Group of 20 countries began the Debt Service Suspension Initiative (DSSI) providing for temporary suspension of debt-service payments on official bilateral loans to 73 eligible countries. In April 2021 the G20 bilateral official creditors granted a final extension of the DSSI by 6 months, through the end of 2021. By November 2021 the initiative had provided more than \$5 billion in relief to more than 40 countries (World Bank, 2021b).

In November 2020 the G20 endorsed the Common Framework for Debt Treatments Beyond the DSSI, designed to carry out renegotiation of unsustainable debt owed by low-income countries. The initiative would address official loans of G20 and Paris Club official creditors. Negotiations are to be initiated at the request of the debtor country. The initiative envisions deep debt restructuring where public debt is not sustainable, or multi-year deferral of a portion of debt service payments where debt is sustainable but there are liquidity problems (IMF, 2021h).³⁵

³⁵ As of April 2021, requests for debt negotiations under the Common Framework had been made by Chad, Ethiopia, and Zambia (IMF, 2021 DSSI).

In August, 2021, IMF member countries agreed to a special issue of US\$650 billion in Special Drawing Rights to address the Covid-19 pandemic. The Fund emphasized that US\$275 billion, or 42 percent, will go to emerging market and developing countries (including China). It also called for high-income countries to “identify viable options for voluntary channeling of SDRs ... to poorer and more vulnerable member countries to support their pandemic recovery ...” (IMF, 2021i). For the five EMEs specially examined above, the SDR issuance is a modest increment to existing external reserves for Brazil (by 4.3 percent), Colombia (4.8 percent), and India (3.3 percent), but somewhat more significant for South Africa (an increment of 8.8 percent) and Turkey (12.7 percent).³⁶

The IMF has stated that “Many emerging market economies are also at significant risk of debt distress and since the onset of the pandemic a few have announced their intention to seek debt restructurings. Argentina and Ecuador, for example, have already concluded debt restructurings, while for others debt restructurings remain a work in progress ... The Fund stands ready to support these countries by providing financing and supporting their efforts for debt restructuring when this is needed (IMF, 2021h, p. 12).

Possible debt restructurings remain in a framework of case-by-case circumstances. With respect to the five economies specially examined, the most recent debt sustainability analyses in the IMF country reports (“Article IV”) judged that Brazil’s “risks are assessed to be moderate ... [albeit] the debt-to-GDP ratio is highly sensitive to shocks to real GDP growth, fiscal deficits, and borrowing costs.” The Fund found that Colombia’s public debt was “expected to remain sustainable in the medium term.” For India, it found that “meaningful reduction in public debt ... is crucial to regaining fiscal space,” but that “Risks are mitigated because public debt is denominated in domestic currency and predominantly held by residents, while the statutory liquidity requirement creates a captive domestic market for debt” (IMF, 2021c, 50; d, 42; e, 50).

The Fund’s most recent Article IV review for South Africa is nearly two years out of date (IMF, 2020a). For Turkey, its debt sustainability analysis finds that “Gross public sector financing needs ... are expected to remain high over the medium term, posing significant liquidity risks. ... although Turkey’s public debt remains below vulnerability benchmarks ... debt increases and does not stabilize by 2026.” It notes risk from reliance on shorter-maturity domestic borrowing and high reliance on foreign currency borrowing (IMF, 2021f, 63).

Conclusion and Policy Implications

In comparison to the Global Financial Crisis that began in 2007, growth outcomes will have been worse for emerging market and developing economies (EMDEs) as a group in the Covid-19 shock, but better for the advanced economies (AEs), albeit at the expense of larger buildups in public debt for the latter. The current prospects are that the pandemic recession will be only slightly worse than the GFC For the world as a whole (table 1).

³⁶ Calculated against end-2020 reserves as reported by IMF (2021b) and applying country shares in total quotas (IMF, 2021j).

For eleven major EMEs examined in this study, IMF-projected ratios of net public debt to GDP by 2024 have risen from a median of 45 percent of GDP to 61 percent (table 3). In contrast, median interest payments projected by 2024 have only risen from 2.8 percent of GDP to 3.1 percent (table 4). After an initial surge in 10-year government bond rates, these rates fell to levels lower than before for most of the eleven EMEs. However, by late 2021 the rates were back up to pre-pandemic levels for most (figure 2). Similarly, after an initial swing from inflows to large outflows of foreign capital, flows soon reverted to moderate positive levels (figure 3).

Tests for whether there has been a severe deterioration on six alternative metrics (net debt to GDP ratio, interest to GDP ratio, real interest rate, real debt service ratio, credit default swap rate, and country rating) identify five EMEs as warranting greater concern: Brazil, South Africa, Turkey, and to a lesser degree, India and Colombia. A stress test for these five economies simulates the impact of a 200 basis-point interest rate shock on key debt indicators.

The interest rate shock causes only moderate proportionate changes in debt ratios by 2026, but somewhat larger proportionate changes for the real debt service ratio. The proportionate changes are larger for the ratios of interest to GDP, averaging about one-fifth increase in the interest/GDP ratio from baseline by 2026, representing an average of about 1 percent of GDP in additional interest expense. The increase is highest for Brazil, South Africa, reflecting their high debt and interest baselines.

Overall, so far there has been no generalized slide of the major emerging market economies into unsustainable debt burdens requiring debt renegotiation with partial forgiveness. An important difference from earlier crises is that most public debt in major emerging market economies is now owed in domestic rather than foreign currency, and to domestic rather than foreign holders. With regard to further pandemic risk, an encouraging sign is that the principal EMEs have reached relatively high vaccination levels, with several higher than the US level (table 2).

It will nonetheless be important that the economies identified as more at risk achieve the paths of reducing primary fiscal deficits projected for four of them (Brazil, South Africa, India, and Colombia; figure 7). By implication, Turkey courts risk by failing to be on a fiscal adjustment path. Avoidance of a need for restructuring could also be challenged if there is a major shock to interest rates, following the past several years of abnormally low rates in global financial markets.

Appendix A

An Accounting Model for the Real Debt Service Ratio

Let public debt at the end of year t be D_t ; nominal GDP, Y_t ; interest payable, INT_t ; the primary surplus for the year, PS_t ; amortization payable, AMZ_t ; and new borrowing, B_t . Let the consumer price index be P_t^C , and the GDP deflator, P_t^Y .

The paths of the fiscal variables are then related as follows. Debt grows from the accumulation of deficits, assuming the government does not also build up assets. Thus,

$$1) D_t = D_{t-1} + INT_t - PS_t$$

New borrowing must cover both the fiscal deficit and the amortization due on legacy debt. Thus,

$$2) B_t = AMZ_t + INT_t - PS_t$$

Amortization can be estimated as the amortization rate, α , typical for the term structure of the country's debt, estimated as the ratio of the year's amortization to debt outstanding at the end of the previous year.

$$3) AMZ_t = \alpha D_{t-1}$$

Interest due will be the sum of the remaining stock of debt of each vintage $t-k$ multiplied by the prevailing interest rate on the government's borrowing in that year (i_{t-k}), dating back to M years earlier where M is the average original maturity of the debt.

$$4) INT_t = \sum_{k=1}^M i_{t-k} D_{t-1}^{t-k}$$

The outstanding stock of debt originally incurred in year $t-k$ and remaining at the end of the most recent year will be:

$$5) D_{t-1}^{t-k} = B_{t-k} \times \left(1 - \frac{k}{M}\right)$$

Debt service is the sum of interest and amortization. Real debt service can be calculated as debt service divided by the consumer price index. The Real Debt Service Ratio, RSDR, divides real debt service by real GDP. Real GDP is nominal GDP divided by the GDP deflator. The Real Debt Service Ratio is then:

$$6) RDSR_t = \frac{(AMZ_t + INT_t)/P_t^c}{Y_t/P_t^Y}$$

The interest shock simulations examine changes from baseline in debt, interest, amortization, and borrowing. The baseline paths of GDP and the primary deficit are treated as exogenous and remain unchanged in the interest shock scenario. The WEO projections provide the baselines for all except amortization and new borrowing, which are not reported in the IMF projections and must be estimated.

For each year in the projections for 2023-25, the change in interest payments caused by the interest rate shock equals the sum over previous years – starting in 2022 – of borrowing for the year in question multiplied by the change in the interest rate, 200 basis points. (For example, interest payments in 2024 equal baseline interest payments, plus 0.02 times borrowing in 2022, plus 0.02 times borrowing in 2023). The time path of the changes in debt from the baseline as a consequence of the interest shock is the cumulation of the changes in interest payments for 2022 through the year in question.

The estimate of amortization in the baseline is an average between a path calculated applying a constant maturity-based amortization fraction of debt outstanding in the previous year, and an estimate derived from IMF Article IV projections of gross financing needs (GFN). If no new borrowing is used to accumulate assets, then the GFN must equal the sum of the year’s fiscal deficit plus the year’s amortization. In the GFN approach, amortization is obtained by subtracting the projected fiscal deficit from the projected gross financing needs.³⁷

³⁷ For example, in Brazil the average residual maturity of public debt is 3.4 years, so the amortization estimate equals prior year debt multiplied by 1/3.4, or 29.4 percent. In the most recent IMF Article IV report for Brazil (IMF, 2021c), gross financing needs in 2022 are 20.1 percent of GDP, and the fiscal deficit is 6.4 percent of GDP, placing amortization as the difference at 15.7 percent of GDP. The GFN-based estimate amounts to an amortization rate of 22.9 percent of prior year debt.

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