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Sovereigns - Global

Weakest MENA and APAC sovereigns would be most sensitive to an interest rate shock

Government debt has generally stabilized, albeit at much higher levels than at the start of the last global monetary tightening cycle. While we expect global financing conditions to tighten gradually, relatively high debt burdens and weak debt affordability leave sovereigns with smaller buffers to face potential shocks.

We assess sovereigns' sensitivity to a larger than anticipated rise in the cost of debt under two scenarios: a moderate shock involving a still relatively gradual increase in the cost of debt (250 basis points above baseline by 2021); and a severe shock with a much sharper, more immediate spike in yields (350 basis points above baseline by 2021). While we measure exposure for all countries, the probability of shocks tends to be higher for frontier markets.

» **Maturity, affordability, size of debt burden determine erosion in fiscal strength** The most vulnerable sovereigns are generally low rated, with shorter maturities and weak debt affordability. A few highly rated sovereigns with elevated debt burdens are also exposed, but we assign a low probability of a shock. The most exposed sovereigns generally exhibit very low fiscal strength. A deterioration in fiscal metrics that exacerbated already significant liquidity and external risks could weigh on these sovereigns' ratings.

» **A moderate shock is generally manageable**, with the possible exceptions of sovereigns with already very low fiscal strength. Interest payments would absorb an additional 3% of revenue by 2021 for the 30 most exposed sovereigns on average, compared with no change in the baseline; the debt burden would fall by only two percentage points in the next four years, half as fast as in the baseline.

» **A severe shock would strain ratings of a range of lower-rated sovereigns**, absent a policy response that effectively mitigated the deterioration in fiscal strength, in particular in debt affordability.

» **The most exposed sovereigns are in MENA, APAC** At a regional level, Latin America & the Caribbean and Sub-Saharan Africa are most exposed via weaker debt affordability. For Sub-Saharan Africa, this would add to refinancing pressures ahead of large debt maturities due next decade. At a sovereign level, exposure is highest for Lebanon, Egypt, Pakistan, Bahrain and Mongolia, followed by Sri Lanka and Jordan.

» **Exchange rate shocks would exacerbate negative credit effects** for Mongolia and Ghana, since a currency shock would likely accompany a higher cost of debt. For others, defending fixed or managed exchange rates could pressure reserves, particularly relevant for Lebanon, Pakistan, Bahrain and Jordan.

Maturity, affordability, size of debt determine erosion in fiscal strength

Relatively high debt burdens reduce buffers as financing conditions tighten globally

After years of accommodative monetary policy by the major central banks, we expect interest rates to gradually rise in the US (Aaa stable) and in Europe. By 2021, we forecast that the US Federal Reserve will raise its policy rate to 3.25% and the European Central Bank to 1.0% (see Exhibit 1). Global financing conditions will also tighten as the Federal Reserve gradually shrinks its balance sheet (see Exhibit 2).

Exhibit 1

Global financing conditions will tighten in our central scenario ...
(Policy rates and Moody's forecasts, %)

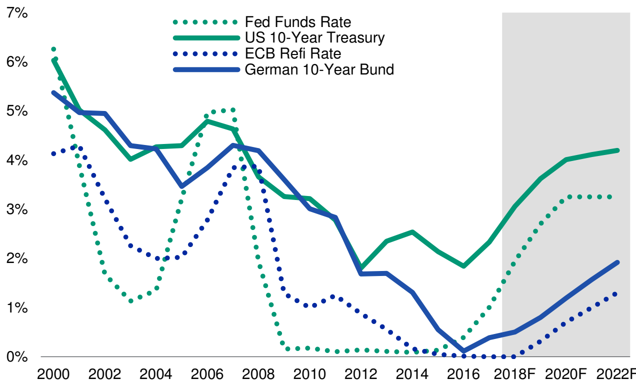
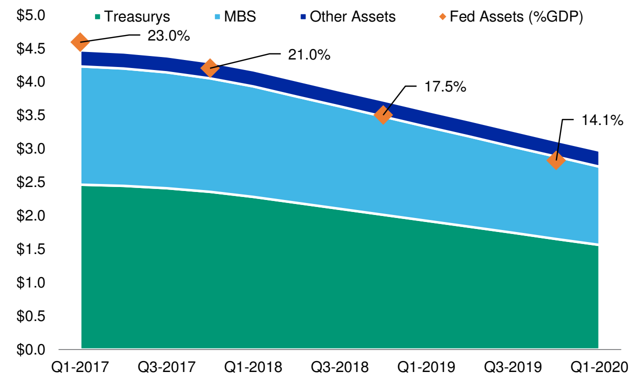


Exhibit 2

... particularly as the Federal Reserve shrinks its balance sheet
($ trillion)



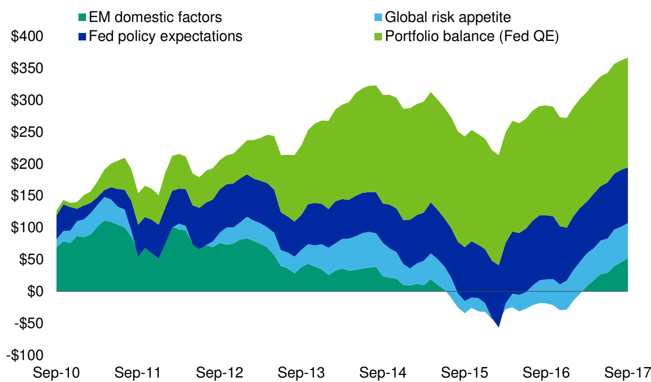
Sources: Federal Reserve projections, Moody's Investors Service

Our baseline forecasts and our sovereign ratings take into account a gradual tightening in financing conditions due to the withdrawal of monetary policy accommodation.

However, financing conditions could tighten more rapidly than we currently assume, either globally or for specific sovereigns. For instance, the impact of the unwinding of quantitative easing on portfolio flows to emerging markets remains untested (see Exhibit 3), and could contribute to higher risk premia (see Exhibit 4). In recent weeks, financing conditions have tightened with yields and/or exchange rates under pressure for a number of emerging and frontier markets; capital flows have also slowed.

Exhibit 3

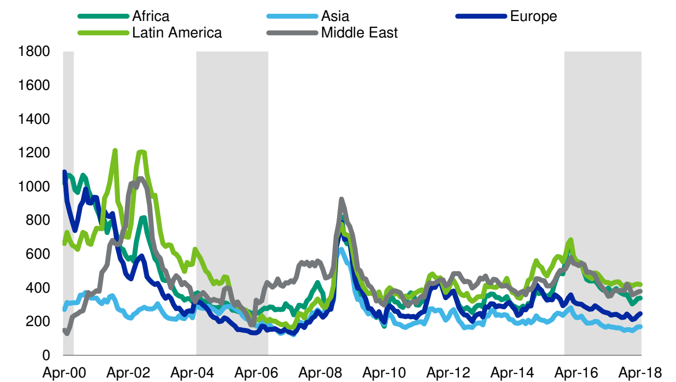
Impact of Fed unwinding of quantitative easing on emerging market portfolio flows is untested ...
(Cumulative contributions to emerging market portfolio flows, $ billion)



Source: IMF Global Financial Stability Report

Exhibit 4

... and could lead to higher risk premia
(EMBI Global: regional sovereign bond spreads, basis points)



Note: Shading depicts Fed monetary policy tightening cycles
Sources: JPMorgan/Haver Analytics, Moody's Investors Service

A number of sovereigns, in particular lower income countries, have relatively high debt burdens, eroded revenue bases after the commodity price shocks, and untested capacity to refinance sizable maturities in tighter financing conditions.

While government debt has generally stabilized, it is much higher than at the start of the previous global tightening cycle in 2004-06, reducing fiscal flexibility in the face of a potential financing shock (see Exhibits 5 and 6). As portfolios shift, a change in investors' assessments of some of these sovereigns' capacity to carry and service their debt could sharply raise the cost of borrowing.

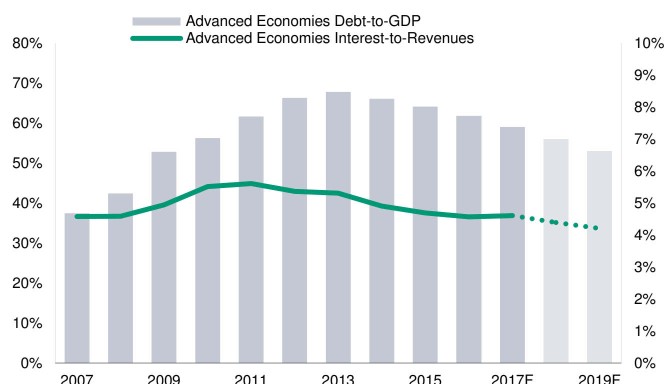
Spikes in regional risk premia have on average ranged between 200 and 300 basis points, which guides the magnitude of the shocks applied in the sensitivity analyses in this report. Here, we study the impact such shocks would have if sustained.

We measure exposure to a higher cost of debt by applying the same shock to 125 of the sovereigns that we rate. The likelihood of such shocks materializing is very low for highly rated sovereigns, which tend to fund themselves at relatively low cost, even through periods of higher risk aversion. The probability of such shocks materializing is higher for emerging markets and frontier markets.

Exhibit 5

Government debt burdens and affordability are set to improve for advanced economies ...

(Median debt-to-GDP left axis, median interest-to-revenues right axis, %)

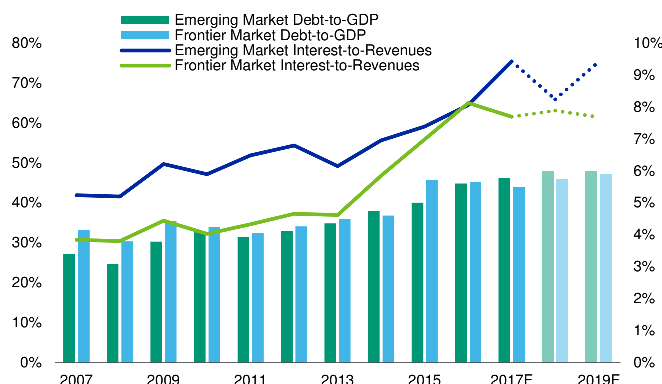


Source: Moody's Investors Service

Exhibit 6

... but not for emerging and frontier markets

(Median debt-to-GDP left axis, median interest-to-revenues right axis, %)



Source: Moody's Investors Service

Exposure to higher cost of borrowing depends on tenor, level and affordability of debt

We quantify the exposure of sovereigns to more adverse financing conditions than we currently expect by looking at the implications for fiscal metrics of two alternative paths for the cost of debt compared with our baseline forecasts.

We take into account the average maturity of government debt to derive the change in the effective cost of overall debt under the shock scenarios. The shorter the maturity, the more quickly a shock to the cost of new debt translates into higher overall cost for government debt.

To derive the implications for debt affordability and the debt burden, we assume government revenue, primary balance and nominal GDP growth to be unchanged from the baseline. The sensitivity analysis gives a first-order impact of a rise in the cost of debt. In practice, concurrent changes in the macroeconomic environment, and the policy response to the macroeconomic and financial shock would also shape sovereigns' credit profiles.

The box on page six explains the approach in more detail.

- **A moderate and gradual shock** (“moderate shock”): This involves a 250 basis point cumulative increase in the cost of new debt by 2021 above our baseline forecast. It starts with a 50 basis point rise in 2018, followed by a 100 basis point increase in 2019, and 50 basis point increases in both 2020 and in 2021. This could be a relatively widespread shock, for instance, if markets broadly adjust their expectations of the pace and extent of tightening in US monetary policy. While triggers of past emerging market crises have varied, shifts in US monetary policy have tended to compound underlying vulnerabilities,[1] including weak fiscal positions. Several empirical analyses show that unanticipated interest rate increases in the US have a particularly significant impact on emerging markets.
- **A severe and more immediate shock** (“severe shock”): This assumes that the cost of new debt is 350 basis points higher than the baseline by 2021. It incorporates a 150 basis point hike above the baseline in 2018, an additional 100 basis points in 2019, and 50 basis point increases in both 2020 and in 2021. We think that this is a very low probability scenario for most sovereigns, in particular for highly rated sovereigns. Such a shock is more likely to be idiosyncratic, reflecting sovereign-specific shifts in risk premia.

We created a fiscal exposure index based on the average of the Z-scores (number of standard deviations from the mean) of the changes compared with our baseline forecasts in each of the four fiscal strength metrics used in our global sovereign rating methodology: government debt to GDP, government debt to revenue, interest payments to GDP and interest payments to revenue. A higher value of the fiscal exposure index denotes higher fiscal susceptibility to a shock to the cost of debt.

We plot the sovereigns most exposed to a rise in the cost of debt and the impact of either shock on their fiscal metrics (see Exhibit 8). For instance, we expect Lebanon's (B3 stable) debt-to-GDP ratio to rise by 4.4 percentage points in the baseline by 2021. In the moderate shock, the debt burden would rise by 8.2 percentage points, nearly twice as much. In the severe shock, the debt burden would rise by 12.2 percentage points to 150.7% of GDP (according to our definition of government debt). Meanwhile, Lebanon's interest-to-revenue ratio would rise by 12.5 and 20.6 percentage points over the next four years in the moderate and severe shocks, compared with the 2.7 percentage points expected in the baseline.

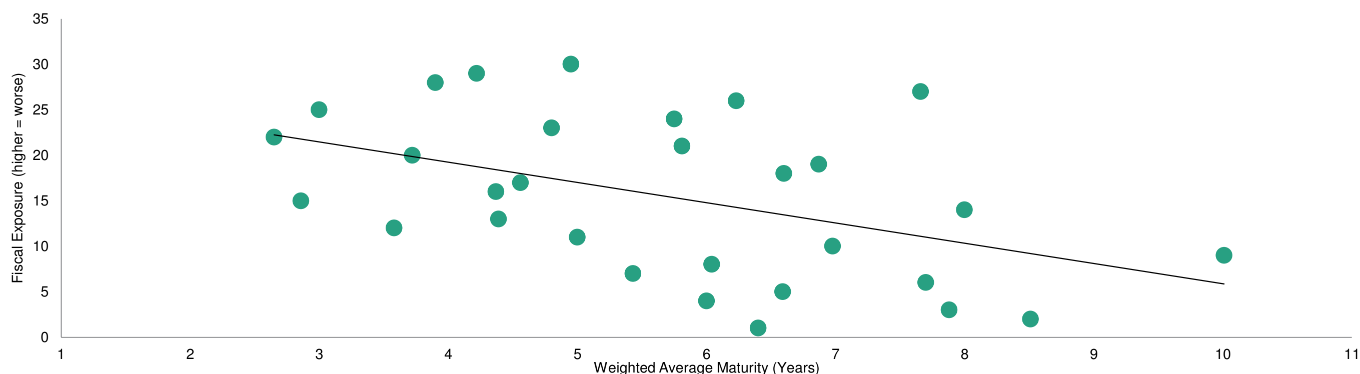
As an indication of how likely the shocks may be, we measure the size of the shock relative to the average cost of debt projected in 2021 in the baseline. For sovereigns with an already high cost of debt, a shock of, say, 250 basis point seems more likely than for sovereigns with a very low cost of debt.

In general, sovereigns with debt of relatively short maturity, weak debt affordability and/or high debt burdens are most exposed to a marked shift in financing conditions (see Exhibit 7).

We also find that within the largely low-rated sovereigns most exposed to higher cost of borrowing, debt affordability challenges come hand-in-hand with relatively low income levels.

Exhibit 7

Shorter average maturity of debt raises rollover risk and overall fiscal exposure to financing shocks



Sources: National authorities, Bloomberg, IMF, World Bank, Moody's analyst estimates, Moody's Investors Service

Exhibit 8

Sovereigns with very low fiscal strength, high debt burdens and short maturity of debt are most exposed to shifts in financing conditions

(Ranked from highest to lowest exposure among most exposed sovereigns as of 2021)

		Current [2017F]		Change in Gen. Gov. Debt/GDP			Change in Gen. Gov. IP/Gen. Gov. Revenue				Probability Analysis	
Top 30 Sovereign Exposures Under Cumulative 250bp or 350bp Risk Premium Shock	Fiscal Exposure	Gen. Gov. Debt/GDP [2017F]	Gen. Gov. IP/Gen. Gov. Revenue [2017F]	Baseline [2021-2017F]	Moderate Shock [2021-2017F]	Severe Shock [2021-2017F]	Baseline [2021-2017F]	Moderate Shock [2021-2017F]	Severe Shock [2021-2017F]		Moderate Shock Probability [=250bp / avg interest on debt in 2021]	Severe Shock Probability [=350bp / avg interest on debt in 2021]
	(higher value = more exposed)	(%)	(%)	(pp)	(pp)	(pp)	(pp)	(pp)	(pp)			
Sovereigns												
Lebanon (B3 STA)	4.82	138.5%	46.1%	4.4	8.2	12.2	2.7	12.5	20.6			
Egypt (B3 STA)	3.13	100.0%	42.6%	-16.9	-14.0	-11.0	-8.4	-1.6	4.2			
Pakistan (B3 STA)	2.77	68.3%	30.5%	-1.8	0.3	2.5	-0.3	7.2	13.5			
Bahrain (B1 NEG)	2.37	82.4%	19.9%	31.0	33.2	35.5	9.4	15.5	20.4			
Mongolia (B3 STA)	2.29	79.6%	19.4%	-14.0	-11.8	-9.3	-6.7	-1.0	3.2			
Sri Lanka (B1 NEG)	1.90	79.6%	35.0%	-5.6	-4.0	-2.4	-0.8	5.3	10.4			
Jordan (B1 STA)	1.87	95.6%	13.4%	-13.8	-11.5	-9.1	0.3	4.8	8.4			
Hungary (Baa3 STA)	1.32	72.3%	6.4%	-3.5	-1.3	1.1	0.2	3.0	5.3			
Italy (Baa2 NEG)	1.15	131.4%	8.2%	-4.3	-2.2	0.1	-0.3	2.2	4.2			
Brazil (Ba2 STA)	1.11	75.6%	20.3%	11.6	13.4	15.3	0.0	3.1	5.7			
Croatia (Ba2 STA)	1.01	82.5%	6.8%	-5.7	-3.7	-1.5	-0.1	2.2	4.2			
Belarus (B3 STA)	0.91	58.8%	4.3%	-10.7	-8.8	-6.9	0.8	3.1	4.8			
Maldives (B2 STA)	0.84	62.0%	5.7%	6.1	7.6	9.2	2.5	5.5	8.0			
Montenegro (B1 STA)	0.82	69.8%	5.9%	-5.2	-3.3	-1.3	-0.6	1.6	3.4			
Portugal (Ba1 POS)	0.82	127.0%	9.7%	-7.6	-5.8	-3.9	-0.6	1.7	3.5			
Serbia (Ba3 STA)	0.82	68.0%	7.4%	-8.5	-6.7	-4.8	-1.0	1.4	3.2			
Mauritius (Baa1 STA)	0.81	58.6%	11.7%	-0.8	0.6	2.0	-0.2	3.1	5.9			
Spain (Baa1 STA)	0.71	98.3%	6.9%	-1.7	0.0	1.7	0.4	2.7	4.6			
Barbados (Caa3 STA)	0.69	105.1%	26.3%	-6.7	-5.3	-3.7	1.3	4.0	6.2			
Gabon (B3 NEG)	0.65	57.2%	16.5%	-8.1	-6.9	-5.7	-6.4	-3.2	-0.6			
Ghana (B3 STA)	0.61	74.4%	33.5%	-10.0	-8.8	-7.5	-11.2	-8.0	-5.4			
Trinidad & Tobago (Ba1 STA)	0.60	62.6%	12.0%	17.6	19.0	20.4	-1.3	1.4	3.6			
St. Vincent and the Grenadines (B3 STA)	0.51	72.8%	7.7%	-8.2	-6.9	-5.5	-0.7	1.8	3.7			
Kenya (B2 STA)	0.49	56.4%	19.0%	0.9	1.9	3.0	-3.3	-0.1	2.4			
Costa Rica (Ba2 NEG)	0.45	47.7%	19.5%	13.0	13.9	14.7	6.5	9.9	12.6			
Angola (B3 STA)	0.40	66.3%	20.8%	-4.2	-3.1	-2.0	-0.4	2.3	4.5			
Ecuador (B3 STA)	0.38	41.8%	10.4%	7.7	8.7	9.8	3.8	6.6	8.9			

Note: We have removed the US, Canada (Aaa stable) and Japan (A1 stable) because the probability of the shocks occurring is very low as we discuss later in the report. The shock probability assessment compares the size of the shock in basis points with the projected cost of debt in 2021. Color-coding from higher probability in dark red to lower probability in white.

Source: Moody's Investors Service

Quantitative estimation of sovereigns' exposure to higher cost of debt

We quantify the first order impact of a higher cost of debt on sovereigns' fiscal metrics by estimating the effect of a larger interest burden on debt affordability and the debt burden. In so doing, we keep government revenue, the primary balance and nominal GDP growth unchanged from our baseline forecast.

We assume that the shock to the cost of borrowing applies to both local and foreign currency debt. The shock may be a shock to domestic funding costs. The shock to financing conditions may also involve a shock to the exchange rate, and hence the cost of foreign currency funding that gradually leads to a higher cost of domestic currency debt. We study the exposure of sovereigns reliant on foreign currency debt separately since the transmission of an exchange rate shock to fiscal metrics differs from that of a shock to the cost of debt.

One key input is the average maturity of debt for each sovereign. We sourced data from the IMF World Economic Outlook and Fiscal Monitor, Bloomberg, national authorities and the World Bank Global Development Finance database, which we complemented with our own estimates where necessary.

For fiscal metrics, we took Moody's analysts' forecasts from the November 2017 Country Credit Statistical Handbook through 2019, and used trends from the October 2017 IMF World Economic Outlook and Fiscal Monitor to complete forecasts of the variables through 2021.

The change in the fiscal metrics compared to the baseline occurs as a rising share of debt is refinanced at the higher, shock-induced cost. For example, for a sovereign with an average maturity of debt at four years and a baseline cost of debt at 2%, and which experiences a 50 basis point interest rate shock every year, then average cost of debt is calculated as follows:

$$Interest_{t+1} = \frac{3}{4} x 2.0\% + \frac{1}{4} x\ 2.5\%$$
$$Interest_{t+2} = \frac{1}{2} x 2.0\% + \frac{1}{4} x\ 2.5\% + \frac{1}{4} x\ 3.0\%$$
$$Interest_{t+3} = \frac{1}{4} x 2.0\% + \frac{1}{4} x\ 2.5\% + \frac{1}{4} x\ 3.0\% + \frac{1}{4} x\ 3.5\%$$

Within four years, the entire stock of debt for that sovereign is refinanced at a higher cost.

From the path for the effective cost of debt, we derive the interest burden, debt affordability (interest payments to revenue and interest payments to GDP), the overall budget balance (primary balance plus interest payments) and the government debt burden. These metrics form the basis of our assessment of sovereigns' fiscal strength.

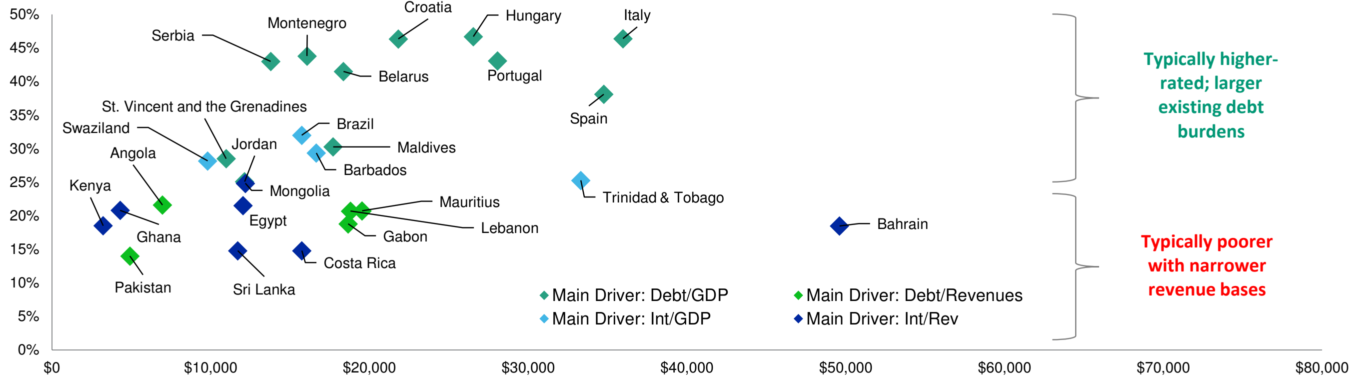
Fiscal exposure index

The value of the fiscal exposure index is each country's average of the Z-scores (number of standard deviations from the mean) of the changes from the baseline of the four metrics that enter our fiscal strength assessment, i.e., debt to GDP, debt to revenue, interest to GDP and interest to revenue). We use the 2021 value of the index in the moderate shock to rank fiscal exposure.

The calculation of the fiscal exposure index allows for a decomposition of which particular fiscal strength sub-indicator is driving the overall exposure (see Exhibit 9). For most emerging markets and frontier markets, weakening debt affordability is the main driver of fiscal exposure. For a few higher-rated sovereigns, an elevated debt burden exposes them to a potential shift in financing conditions.

Exhibit 9

Revenue-generation capacity and income levels explain the drivers of fiscal vulnerability
(Government revenue to GDP, %, y-axis; PPP GDP per capita PPP, 2016, $, x-axis)



Note: The chart shows the sovereigns most exposed to a shock to a higher cost of debt.
Source: Moody's Investors Service

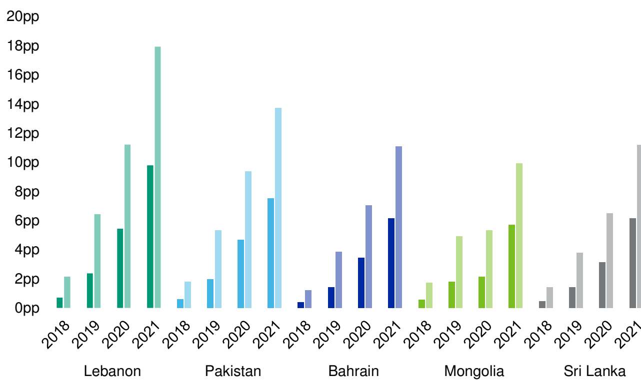
The most exposed sovereigns generally exhibit very low fiscal strength

For five of the 10 most exposed sovereigns – Lebanon, Pakistan (B3 stable), Mongolia (B3 stable), Sri Lanka (B1 negative) and Bahrain (B1 negative) – our assessment of fiscal strength is "Very Low (-)," the weakest on the 15-rung scale in our global sovereign rating methodology. While weak fiscal strength is already a key feature of these countries' credit profiles, a deterioration in fiscal metrics that would further exacerbate liquidity and external risks could weaken credit quality in either of the two potential shocks that we study.

Under a higher cost of debt, there would be pronounced shifts in debt affordability (interest to revenue) and burdens (debt to GDP) for these sovereigns (see Exhibits 10 and 11). A shock to funding costs feeds through to debt affordability relatively quickly. For instance, under the moderate shock, Lebanon's interest-to-revenue ratio would rise to just below 60% by 2021, compared with 49% in our baseline. At around five years, Lebanon's weighted average maturity is 2.5 years shorter than the median for rated sovereigns.

Exhibit 10

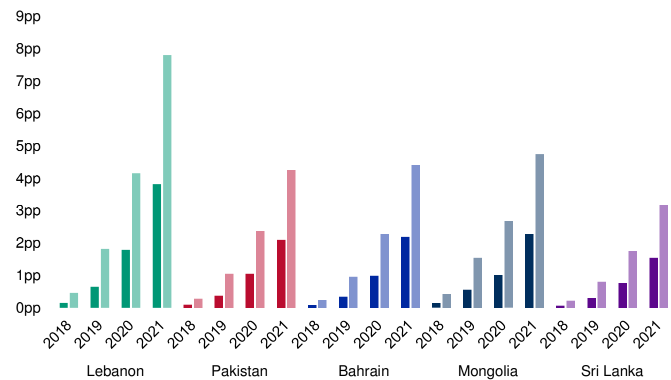
Debt affordability for sovereigns with lowest fiscal strength would deteriorate rapidly in shock scenarios
(Change in interest to revenue compared to baseline, percentage points)



Note: "Moderate shock" in full-colored bars, "severe shock" in transparent bars
Source: Moody's Investors Service

Exhibit 11

Debt burdens would increase at a slower pace
(Change in debt to GDP compared to baseline, percentage points)



Note: "Moderate shock" in full-colored bars, "severe shock" in transparent bars
Source: Moody's Investors Service

A very high debt burden, which we estimated at 138.5% of GDP in 2017,[2] combined with debt of relatively short maturity and amplifies Lebanon's exposure to higher debt costs. Such a weakening in fiscal metrics would exacerbate liquidity risk and strain sovereign creditworthiness.

For Pakistan and Bahrain, interest to revenue would rise to 37% and 35%, respectively, by 2021 under the moderate shock scenario, compared with around 30% in the baseline. These very high levels could strain market access and weigh on credit quality.

Large emerging markets generally sheltered by long debt maturities

With the exception of Brazil (Ba2 stable), large emerging markets such as Argentina (B2 stable), Indonesia (Baa2 stable) or Turkey (Ba2 stable) are not among the sovereigns whose fiscal accounts are most exposed to a tightening in financing conditions.

A relatively long average maturity of debt generally reduces the credit impact of a sudden rise in interest rates. For Argentina, the average maturity of the government's debt is around 10 years. It is also around 10 years for India (Baa2 stable), around nine years for Mexico (A3 stable) and Indonesia, and nearly 13 years for South Africa (Baa3 stable).

The average maturity of government debt for Turkey and Russia (Ba1 positive) is similar to Brazil's, at six to seven years. Much lower debt burdens and stronger debt affordability for Turkey and Russia makes them less exposed to a tightening in financing conditions than Brazil. In the case of Turkey, however, a broad-based tightening would weigh on the sovereign's credit profile because of the related pressure on the country's external position.

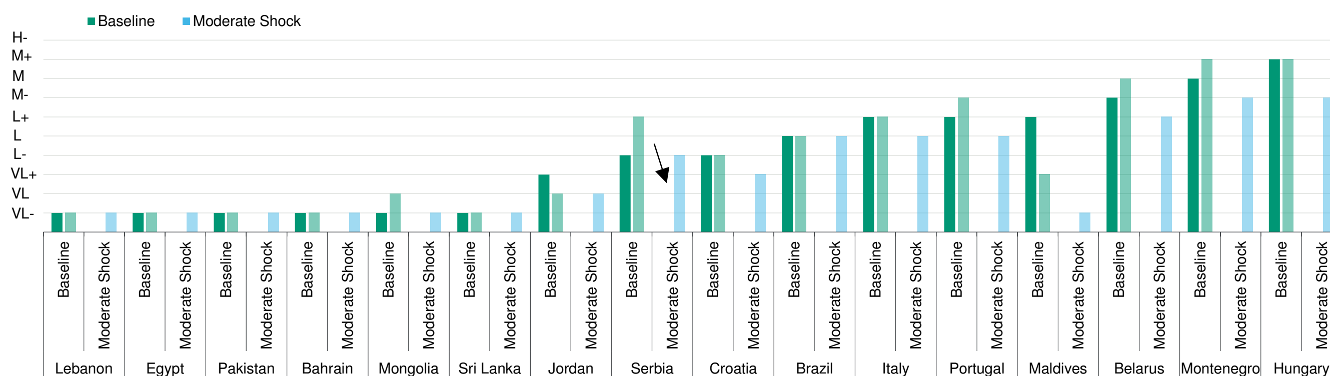
A moderate shock is generally manageable

On average for the 30 most exposed sovereigns, interest payments would absorb an additional 3% of revenue by 2021 under the moderate shock, compared with no change in the baseline. The debt burden would fall by two percentage points in the next four years, half as fast as in the baseline. Such changes in fiscal metrics represent a limited erosion in fiscal strength.

Excluding the most exposed sovereigns that already have “Very Low (-)” fiscal strength, a moderate shock would lower fiscal strength[3] for over half of the most exposed sovereigns compared with our baseline, generally by one to two notches (for instance for Belarus (B3 stable), Croatia (Ba2 stable), Hungary and Montenegro (B1 stable), Exhibit 12). For Maldives (B2 stable), the weakening in fiscal strength would amplify the fiscal pressure that we expect in the baseline.

Exhibit 12

Fiscal strength would weaken by up to two notches among most exposed sovereigns in the moderate shock



Note: 2017 in full-colored bars, 2021F in transparent bars. Exhibit shows the direct impact on fiscal strength of a shock to the cost of debt in the absence of policy response.
Source: Moody's Investors Service

A severe shock would strain ratings of a range of lower-rated sovereigns

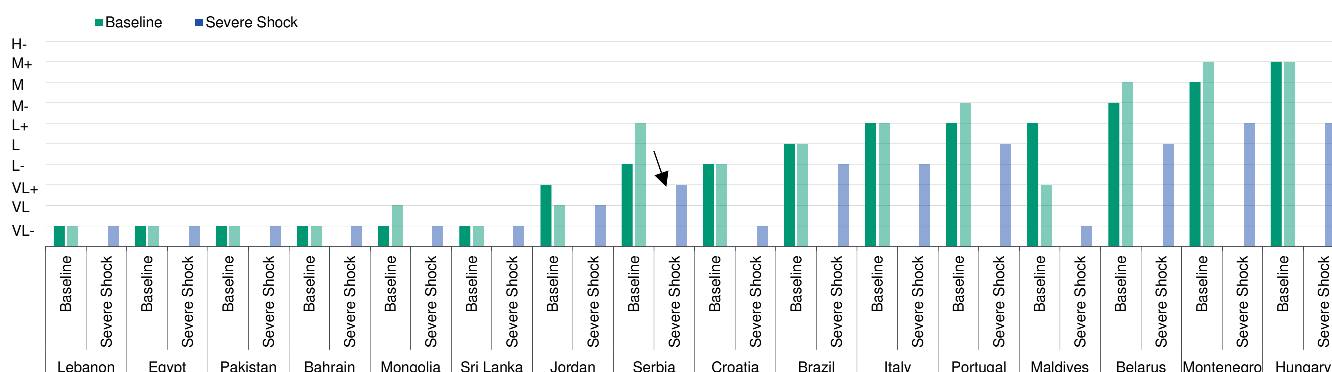
In the severe shock, interest payments would on average absorb an additional 5% of revenue by 2021 compared to the baseline for the 30 most exposed sovereigns. The debt burden would not fall as we expect in the baseline.

Mainly because of weaker debt affordability, all the most exposed emerging market and frontier market sovereigns would see fiscal strength weaken – by up to three notches compared to our baseline expectations for Belarus, Croatia, Hungary and Serbia (Ba3 stable) (see Exhibit 13).

Absent a policy response that effectively mitigated the erosion of fiscal strength, these shifts would strain ratings, even for sovereigns we already assess with the lowest fiscal strength.

Exhibit 13

Fiscal strength would weaken by up to three notches among some of the most exposed sovereigns in the severe shock



Note: 2017 in full-colored bars, 2021F in transparent bars. Exhibit shows the direct impact on fiscal strength of a shock to the cost of debt in the absence of policy response.
Source: Moody's Investors Service

The most exposed sovereigns are in MENA, APAC

The impact of a tightening in financing conditions is only significant for a few sovereigns. As shown below, the region-wide effects tend to be small.

When the impact is material, it tends to manifest mainly in weakened debt affordability. The direct effect of tightening conditions on the debt burden is limited and gradual.

Latin America and Caribbean, and Sub-Saharan Africa are the most exposed regions

At the regional level, median debt affordability metrics are weakest in Latin America and the Caribbean, and have deteriorated most markedly since the start of the decade in Sub-Saharan Africa (see Exhibit 14).

This weak starting position exposes many sovereigns in these regions to a refinancing shock. In the case of Sub-Saharan Africa (SSA), this is particularly relevant ahead of large maturities due early next decade that will contribute to refinancing risks.[4]

For the median sovereign in each region, interest-to-revenue would rise by about 1.1 percentage points in 2021 under the moderate shock, and by about 3.5 percentage points under the severe shock.

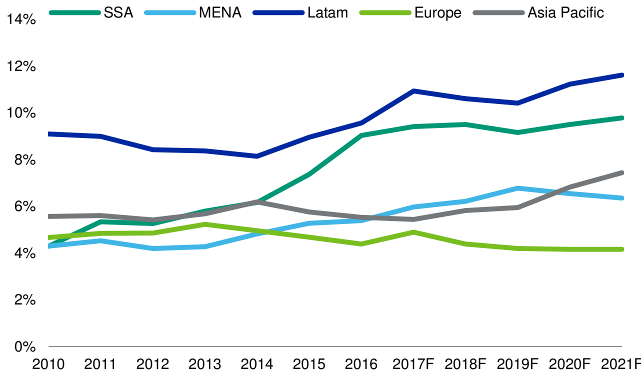
In Asia Pacific (APAC), we already project some weakening in debt affordability in the baseline, from a relatively strong position. This is the result of interest costs rising from relatively low levels and general government revenue not keeping pace due to often narrow tax bases. As a region, the shock exposure for Asia Pacific is less pronounced than for Latin America and Sub-Saharan Africa; debt affordability worsens by 0.9 and 2.8 percentage points, under the moderate and severe shocks respectively.

For the Middle East and North Africa, higher hydrocarbon prices than in 2015-16 and some measures aimed at broadening the tax base will partly reverse the weakening in debt affordability seen in recent years in the baseline.

In Europe, in the baseline scenario, many sovereigns will continue to refinance debt at lower cost than five to seven years ago, even as central banks start raising interest rates.

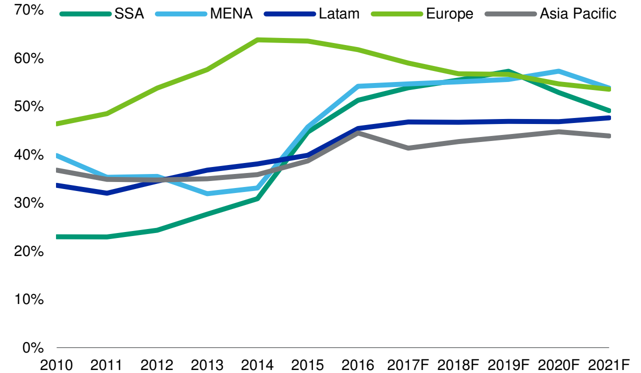
For the median sovereign in these two regions, debt affordability worsens by about 0.8 percentage point in the moderate shock relative to the baseline, and by between 2.1 and 2.7 percentage points in the severe shock in Europe and in the Middle East and North America, respectively.

Exhibit 14
Debt affordability is weakest in Latin America and Sub Saharan Africa...
(Regional median interest to revenue, baseline forecasts, %)



Source: Moody's Investors Service

Exhibit 15
... while higher debt burdens expose Europe and MENA
(Regional median debt to GDP, baseline forecasts, %)



Source: Moody's Investors Service

Middle East and North Africa, and Europe have a higher median debt burden (see Exhibit 15). These regions would see debt to GDP rise by 0.9 percentage point under the moderate shock, and by 1.8 percentage points under the severe shock, a manageable amount.

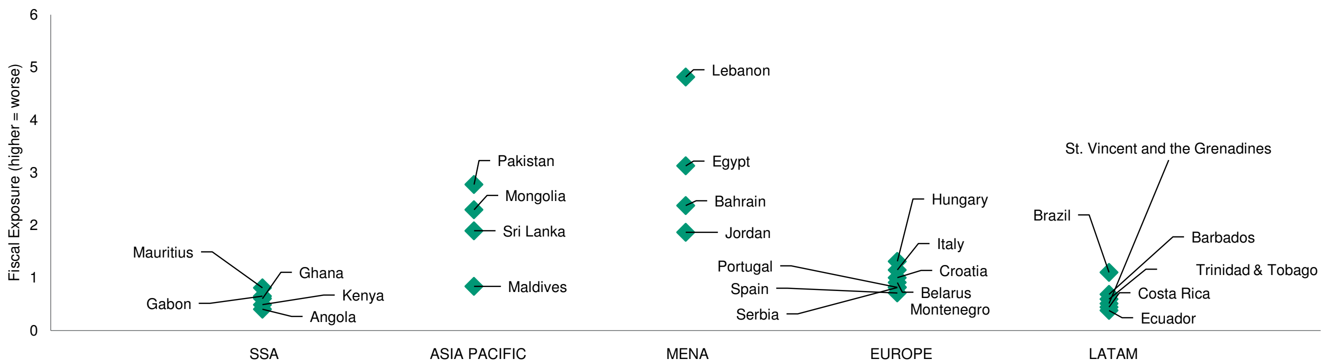
Region-wide, Sub-Saharan Africa is the next most exposed region from a debt burden perspective. Debt to GDP would increase by 0.7 and 1.5 percentage points above the baseline under the moderate and severe shocks, respectively.

We project Latin America's median debt burden to increase toward 47% in 2021 in the baseline scenario, marginally higher than the median baseline for APAC. The exposure to a higher debt burden is similar in both regions at 0.6 to 1.3 percentage points relative to the baseline under either shock.

At sovereign level, exposure is highest for some in Middle East and North Africa, and Asia Pacific

Eight of the top 10 most exposed sovereigns are in the Middle East and North Africa and Asia Pacific regions (see Exhibit 16).

Exhibit 16
Lebanon, Egypt, Pakistan, Bahrain and Mongolia are most exposed to a higher cost of debt
(Higher fiscal exposure = more exposed, moderate shock)



Source: Moody's Investors Service

In Middle East and North Africa, these include Lebanon, Egypt (B3 stable), Bahrain and Jordan (B1 stable), all of which have large fiscal exposures due to high debt ratios, low debt affordability, and high rollover risk.

The sensitivity of interest to revenue to higher interest rates ranges from 9.8 percentage points in Lebanon to 4.4 percentage points in Jordan in the moderate shock (17.9 percentage points to 8.1 percentage points in the severe shock scenario). Debt to GDP rises by between 3.8 percentage points in Lebanon and 2.2 percentage points in Bahrain in the moderate shock compared with our baseline forecast (7.8 percentage points to 4.4 percentage points in the severe shock). Beside Bahrain, the rest of the Gulf is relatively less exposed because of more moderate debt levels.

In Asia Pacific, Pakistan, Mongolia, Sri Lanka and Maldives are most exposed to a higher cost of debt that feeds mostly through weaker debt affordability. The interest-to-revenue ratio rises between 7.5 percentage points in Pakistan and 3.0 percentage points in Maldives in the moderate shock. For Mongolia, Pakistan and to some extent, Maldives, reliance on short-term debt implies that higher yields feed through to debt servicing costs relatively quickly.

Within Sub-Saharan Africa, Mauritius (Baa1 stable), Gabon (B3 negative), Ghana (B3 stable), Kenya (B2 stable) and Angola (B3 stable) are the most exposed sovereigns to higher interest rates, with increases in interest to revenue compared with the baseline ranging from 3.3 percentage points in Mauritius by 2021, to 2.7 percentage points in Angola in the moderate shock (and between 6.1 percentage points and 4.9 percentage points in the severe shock).

Meanwhile, the most exposed sovereign in Latin America is Brazil, featuring both a high debt burden at 75.6% of GDP in 2017 and weak debt affordability with interest to revenue at 20.3%. It is followed by Barbados (Caa3 stable), Trinidad & Tobago (Ba1 stable), St. Vincent and the Grenadines (SVG, B3 stable), Costa Rica (Ba2 negative) and Ecuador (B3 stable). Notwithstanding quite long debt maturities (within this group, Ecuador has the shortest average maturity at 5.8 years), relatively high debt burdens contribute to high exposure to financing shocks. In these countries, the affordability ratio worsens by between 3.3 percentage points in Costa Rica and 2.5 percentage points in SVG in the moderate shock, and between 6.0 percentage points and 4.4 percentage points in the severe shock.

In Europe, outside the euro area, we see the highest exposure in Hungary (Baa3 stable), Croatia (Ba2 stable), Belarus (B3 stable), Montenegro (B1 stable) and Serbia (Ba3 stable). A combination of relatively high debt ratios and quite short weighted average terms to maturity (between three and five years) leads to a rapid deterioration in these countries' debt dynamics in case of a shock to funding costs. Hungary's debt affordability weakens by 2.9 percentage points by 2021 in the moderate shock (around five percentage points in the severe shock).

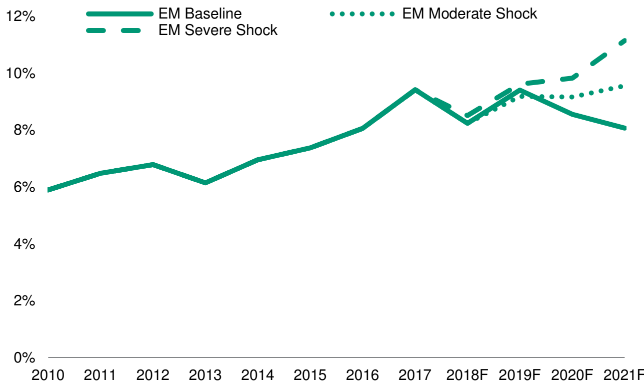
Frontier markets more likely to face a significant shock

Among the 30 most exposed sovereigns, nine are frontier markets,[5] four of which number among the 10 most exposed.

Frontier markets' access to concessional funding sources supports their fiscal profiles by lowering interest costs and lengthening the average term to maturity of the debt stock. However, to a significant extent, frontier markets still rely on very short-term domestic debt, often treasury bills. Among the 30 most exposed sovereigns, the median average maturity is 4.4 years for frontier markets, compared with 5.8 for emerging markets. Similar to emerging markets, this leaves them exposed through transmission of deteriorating debt affordability under the shocks (see Exhibits 17 and 18).

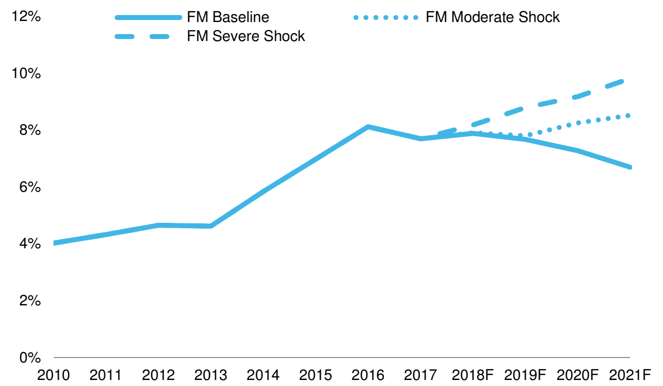
Moreover, generally weaker institutions also suggest that, in a rapid reallocation of investment portfolios, notwithstanding potential constraints related to capital controls, frontier markets would be more likely to experience capital outflows.

Exhibit 17
Emerging markets' exposure is exacerbated by weakening debt affordability
(Emerging market median, interest to revenue, %)



Source: Moody's Investors Service

Exhibit 18
Frontier markets are similarly exposed, but more likely to experience a shock to funding costs
(Frontier market median, interest to revenue, %)



Source: Moody's Investors Service

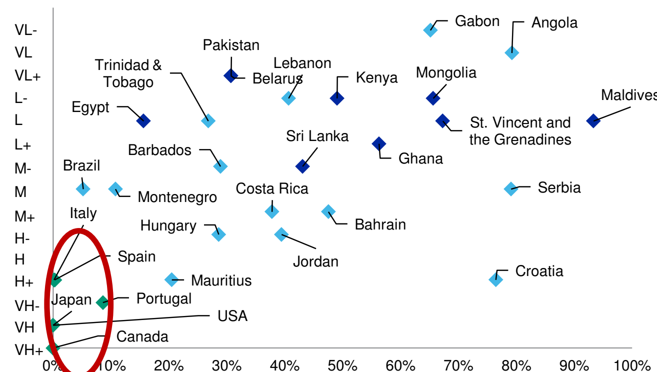
For advanced economies, some exposure but lower likelihood of a shock to funding costs

The group of 30 most exposed sovereigns also includes a number of advanced economies. These are Japan, the US, Canada, Italy, Spain and Portugal.

In light of advanced economies' generally greater monetary policy flexibility, credibility and effectiveness at preventing or countering a shock to funding costs, the probability of such a shock occurring is much lower for these sovereigns than for frontier and emerging markets. The ability of the US Federal Reserve, the ECB and the Bank of Japan to broadly act as price setters contributes to these countries' policy flexibility and credibility, which we capture in their institutional strength scores (see Exhibit 19).

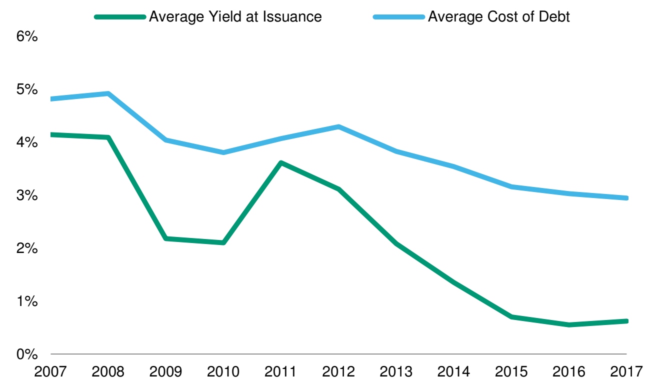
For the US, the vast dominance of the dollar in foreign exchange reserves globally maintains stable demand for dollar assets including US Treasuries. For Japan, the home bias of domestic investors maintains the cost of debt at very low levels. The shocks described above would only occur in an environment of an unraveling home bias, a scenario to which we attach a minimal probability over the next few years.

Exhibit 19
Deep local currency capital markets are a hallmark of higher institutional strength
(Institutional strength score, y-axis; foreign currency share of government debt, x-axis)



Note: Frontier market sovereigns are dark blue, emerging markets light blue, and advanced economies green.
Source: Moody's Investors Service

Exhibit 20
Euro area sovereigns will refinance debt at lower costs in our baseline
(Example: Italy, %)



Note: Average cost of debt is calculated as dividing current year interest payments by an average of current and prior year debt stock
Sources: Italy Ministry of Treasury and Economy, Moody's Investors Service

Euro area sovereigns have been able to refinance their debt at significantly lower rates than in 2010-2012 at the peak of the European sovereign debt crisis. In Italy, the average cost of debt has declined over time as the sovereign refinances its debt at a lower cost – helped by the ECB's bond purchase program and other support mechanisms (see Exhibit 20). The same dynamics hold for Spain and Portugal. Some euro area sovereigns would continue to refinance debt at lower costs in the baseline. Any shock to the cost of debt would occur from very low levels.

Our sensitivity analysis shows that even if the low probability shocks materialized, they would not materially affect these sovereigns' fiscal metrics. Relatively long average maturity of debt, of seven to eight years, shelters these countries from a sudden rise in effective debt servicing costs. The main impact on fiscal strength would come through a higher debt burden, which would increase by between 2.2 percentage points of GDP in 2021 in Italy, 1.8 percentage points in Portugal and 1.7 percentage points in Spain in the moderate shock. In the case of Italy and Portugal, government debt would still decline over the next five years, while for Spain, it would be broadly constant.

Exchange rate shocks, policy constraints would exacerbate negative credit effects

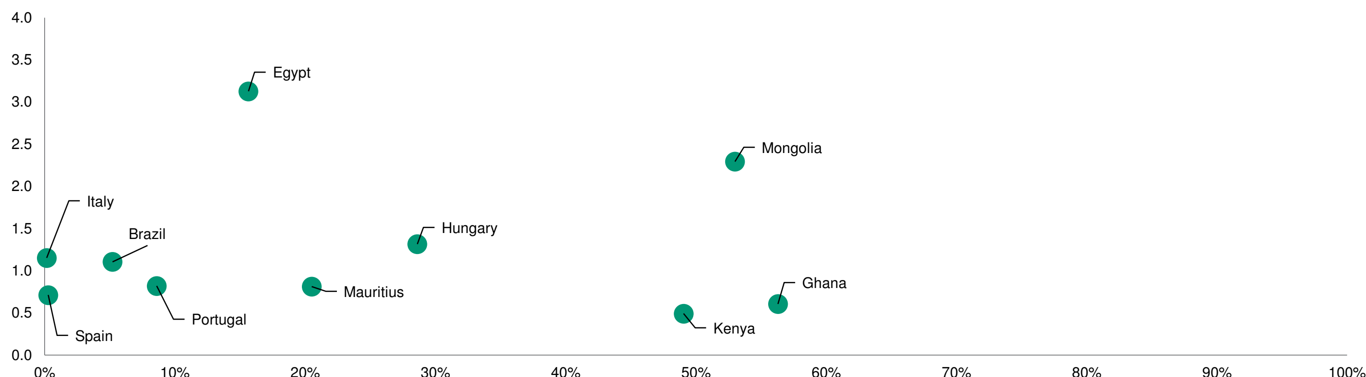
Besides higher interest rates, tightening financing conditions would also involve weakening exchange rates. This would exacerbate the negative impact of the shock on fiscal metrics through a higher foreign currency debt burden.

While the interest rate side of a shock to financing conditions feeds through to fiscal strength and credit profiles mainly through weaker debt affordability, a tightening of financing conditions reflected in a weaker exchange rate weighs on fiscal strength and creditworthiness primarily by raising the debt burden. Valuation effects raise the foreign currency proportion of the debt stock in addition to the higher borrowings required to meet foreign currency debt service payments.

We take into account exposure to a sudden depreciation by factoring in the share of foreign currency government debt in our assessment of fiscal strength. Among the sovereigns that we identified as most exposed to interest rate shocks, Mongolia, Ghana, Kenya, Hungary and Mauritius have flexible exchange rate arrangements[6]. Of these, Ghana, Mongolia, and Kenya have foreign currency shares of between 50% and 60%, while Hungary and Mauritius' shares are below 30% (see Exhibit 21).

Exhibit 21

Currency moves would exacerbate impact of higher rates for those with elevated foreign debt
(Fiscal exposure index, y-axis; foreign currency share of general government debt, %, x-axis)



Note: Foreign currency share data is as of 2016. Only sovereigns with flexible exchange rates are shown.
Source: Moody's Investors Service

Based on a quantitative relationship between sudden changes in interest rates and exchange rates,[7] we define a path for exchange rates that would be broadly equivalent to the interest rate path used in each shock.

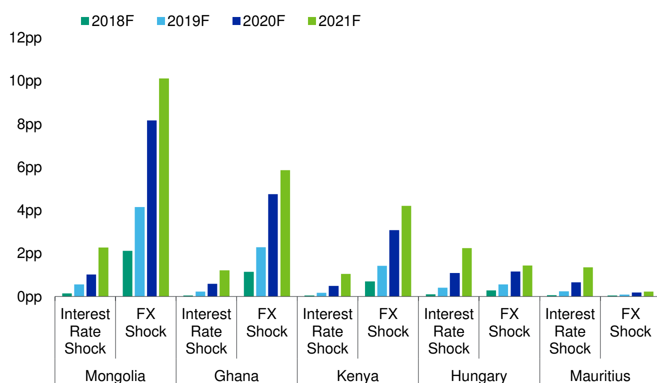
Here the impact of tightening financing conditions materializes first and most significantly on the debt burden, as the value of foreign-currency denominated debt increases immediately with the currency depreciation. Over time, a higher debt burden leads to weaker debt affordability.

We find that Mongolia and Ghana are most exposed to a tightening in financing conditions through weaker exchange rates (see Exhibits 22 and 23). For Egypt, which floated its currency in November 2016, a more moderate foreign currency share at about 30% as of 2017 would limit the currency impact of a tightening in financing conditions on fiscal strength.

Exhibit 22

Higher foreign currency debt exacerbates impact of depreciation under tightening financing ...

(Change in debt to GDP under moderate interest rate shock and a comparable currency shock)

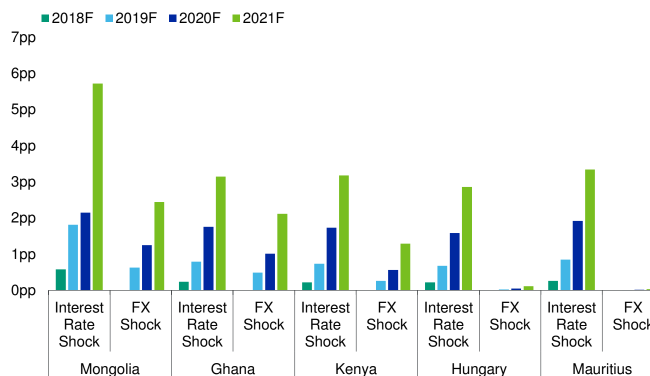


Note: The currency shock simulates a cumulative 25% devaluation against the dollar over the next four years.
Source: Moody's Investors Service

Exhibit 23

... resulting in worsening debt affordability through higher interest payments

(Change in interest to revenue under the moderate shock to interest rates and a comparable currency shock)

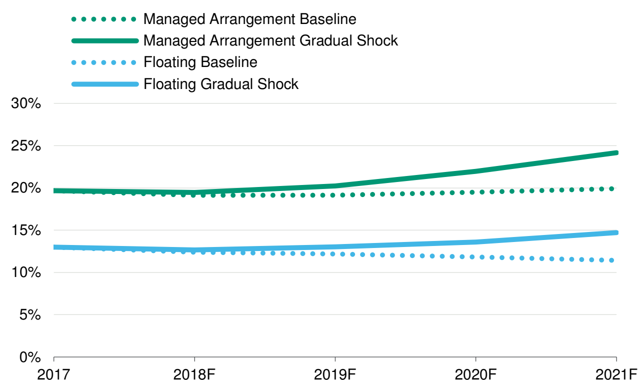


Note: The currency shock simulates a cumulative 25% devaluation against the dollar over the next four years.
Source: Moody's Investors Service

In countries with tightly managed exchange rates, central banks would have very limited flexibility to offset a global financing conditions shock. If central banks needed to support the exchange rate to preserve the current managed arrangements, foreign exchange reserves buffers would erode and external vulnerability would rise.

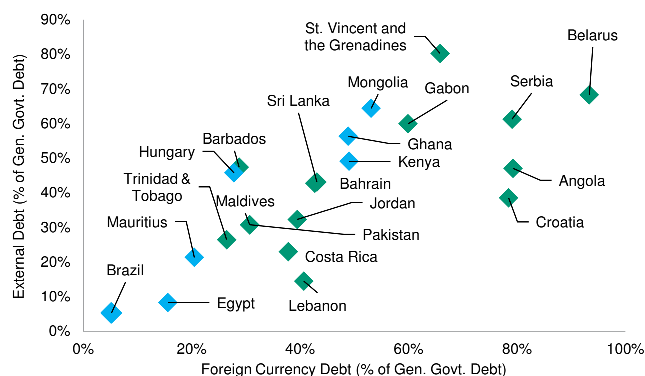
Out of the five sovereigns experiencing the sharpest weakening in debt affordability under the moderate shock, four have managed exchange rates regimes. Out of the 30 most exposed sovereigns, 15 have managed exchange rates. This group of countries features higher interest to revenue in the baseline than sovereigns with floating exchange rates, a gap which persists under the shocks (see Exhibit 24). A deterioration in debt affordability could lower investors' willingness to invest in these countries. Pressure on capital flows and the exchange rate would erode foreign exchange reserves and exacerbate external vulnerability. This is particularly relevant for Lebanon, Pakistan, Bahrain and Jordan and Sri Lanka (although the latter is moving toward a more flexible exchange rate). For Lebanon, and to some extent Pakistan and Jordan, relatively low external debt as a share of total government debt would mitigate liquidity pressures should a shock materialize (see Exhibit 25).

Exhibit 24
Median interest to revenue by currency regime



This chart includes the 30 most exposed sovereigns
Source: Moody's Investors Service

Exhibit 25
Lower external debt share would mitigate pressure on liquidity under exchange rate pressure



Note: floating currencies are in blue, managed currencies in green
Source: Moody's Investors Service

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Endnotes

1 See Koepke (2017), "Determinants of Emerging Market Crises: the Role of U.S. Monetary Policy," IIF Working Paper.

2 Excluding debt held by public entities

3 Projections of fiscal strength scores take into account current gaps between indicative and final scores.

4 See Risks of financing stress build across the region, especially at lower end of the rating scale, November 2017

5 Egypt, Pakistan, Mongolia, Sri Lanka, Belarus, Maldives, Ghana, St. Vincent and the Grenadines, and Kenya. Frontier market sovereigns are defined as sovereigns rated Ba1 or lower that rely on concessional financing for more than 40% of their external government debt.

6 Exchange rate regime classifications are per our November 2017 Country Credit Statistical Handbook, with classifications aggregated as either floating or managed arrangement. Given no separate legal tender, Ecuador and Montenegro have been excluded

7 See Ferrari et al. (2017), "Monetary policy's rising currency impact in the era of ultra-low rates", BIS Working Paper. Gupta et al. (2017), "Should Emerging Markets Worry about U.S. Monetary Policy Announcements?" World Bank Group Policy Research Working Paper

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