# Overcoming "original sin" to secure policy space[1]

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University College London Centre for Finance, 2021 Annual Lecture
10 November 2021

It is a pleasure to join you today. I would like to share some reflections on the global economy and how emerging market economies (EMEs) are faring right now. Last week's issue of *The Economist* magazine compared the current state of the global economy with a badly microwaved dinner, with some parts scalding hot, but other parts only lukewarm.[2]

The strangeness of the current landscape reflects the nature of the shock. The Covid-19 pandemic brought three shocks rolled into one. Above all, it is a health crisis – it is a pandemic, after all. Second, by disrupting everyday economic activity so thoroughly, it brought an economic sudden stop that called for extraordinary measures that expanded the boundary of fiscal and monetary policies. And third, these extraordinary measures were being unveiled in the teeth of a short-lived but sharp financial sudden stop that hit EMEs particularly hard.

Fiscal policy has led the way in terms of the policy response to the pandemic, in both advanced and emerging market economies. As Graph 1 shows, the response has led to large budget deficits in both. Graph 1 also shows how budget deficits are projected to remain high, as governments struggle with headwinds to the recovery, including a possible resurgence of inflation.

Regarding fiscal space, the one bright spot has been that EME governments have been able to borrow in their own currencies, unlike in the run-up to the 1990s emerging market crises. Borrowing in domestic currency has allowed them to avoid currency mismatch that exposes them to a depreciation of the domestic currency. Private corporate borrowers – in both advanced and emerging economies – tend to borrow in international currencies, especially the US dollar. However, EME governments have largely overcome "original sin", which is the proposition that EME borrowers cannot borrow abroad in their own currencies.[3] This proposition seemed well

[1] I am grateful to Burcu Erik, Mert Onen, Murphy Pan and Jimmy Shek for excellent research assistance, and to Agustín Carstens, Stijn Claessens, Boris Hofmann, Benoit Mojon, Goetz von Peter, Ilhyock Shim and Alexandre Tombini for comments.

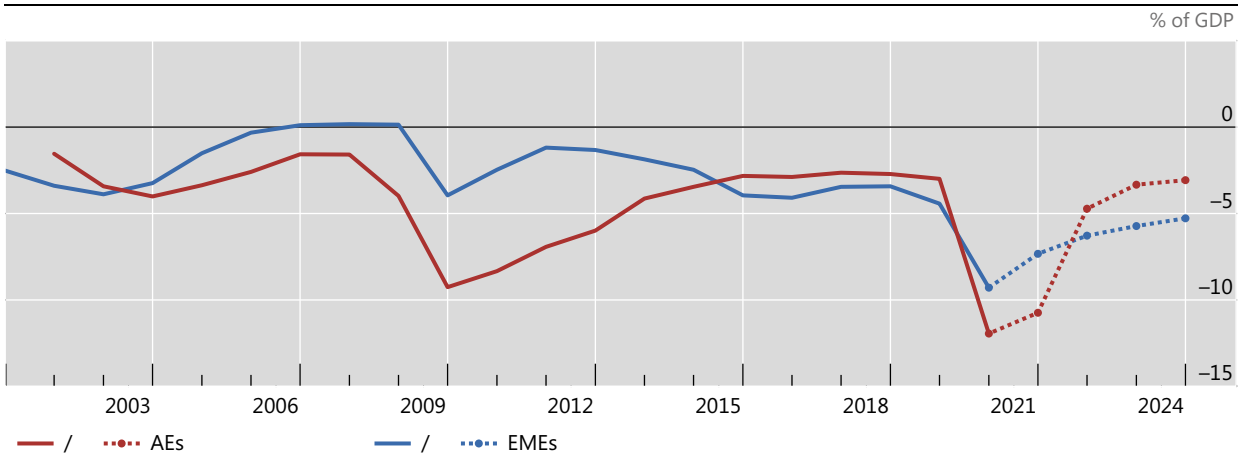
[2] *The Economist*, "Emerging markets, living the high life", 6 November 2021.

[3] See B Eichengreen and R Hausmann, "Exchange rates and financial stability", in *New challenges for monetary policy*, proceedings of the economic policy symposium sponsored by the Federal Reserve Bank of Kansas City in Jackson Hole, 26–28 August 1999, pp 319–67; and B Eichengreen, R Hausmann and U Panizza, "Currency mismatches, debt intolerance, and Original Sin: why are they not the same and why it matters", *NBER Working Papers*, no 10036, October 2003.

established during the turbulent period of emerging market crises of the 1990s, but the intervening two decades or so have turned the situation round quite dramatically.

## Budget deficits amid the pandemic

Graph 1




AEs = AU, CA, CH, DK ,EA ,GB, JP, NO, NZ, SE and US; EMEs = BR, CL, CN, CO, CZ, HK, HU, ID, IN, KR, MX, MY, PE, PH, PL, RU, SA, SG, TH, TR, TW and ZA.

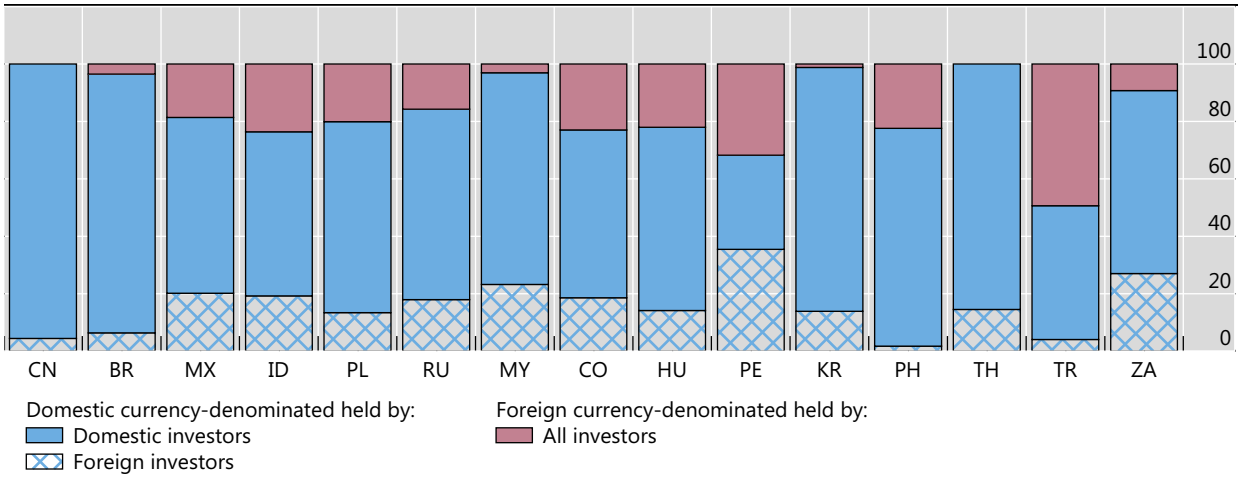
Source: IMF, *World Economic Outlook*.

Graph 2 shows that the share of EME government bonds that are denominated in foreign currency is now quite small in most countries, here shown in the red segments of the bar chart. Instead, the lion's share of government bonds is now denominated in domestic currency. Of these, foreign investors hold a significant portion of the domestic currency-denominated government bonds, shown in the hashed blue segments of the bars.

## Currency denomination and holders of government debt securities[1]

As a percentage of total amounts outstanding, at end-December 2020

Graph 2




[1] Issued on domestic and international markets. Domestic bonds exclude money market instruments.

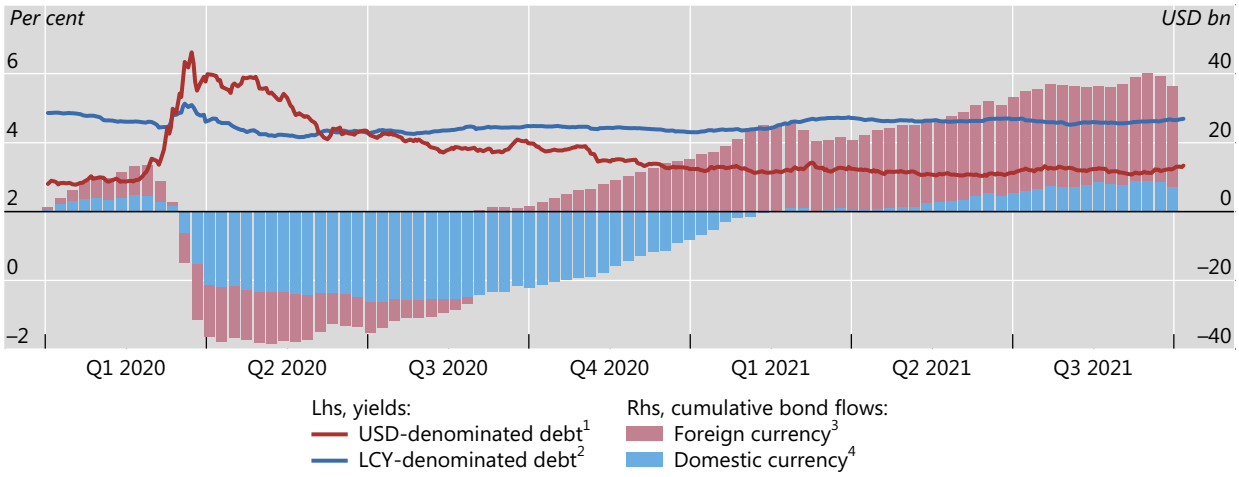
Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS; BIS calculations.

Nevertheless, the financial sudden stop has put severe constraints on the fiscal response. In the early months of the pandemic, we saw sharp outflows from both foreign currency and domestic currency bonds. Portfolio flows to foreign currency bonds (here, primarily corporate bonds) began to recover in the third quarter of 2020 and now comfortably exceed pre-pandemic levels. However, the recovery in domestic currency bonds has been much more faltering. The cumulative flows have only recently overtaken the pre-pandemic level.

Yields on the bonds also give you a sense of how much EMEs have had to pay for this recent recovery in flows in domestic currency bonds (Graph 3). While foreign currency bond yields have largely fallen back in line with advanced economy yields, domestic currency yields are still high and have been trending up. These charts give you a good sense of the additional costs that governments have had to bear in their fiscal response to the pandemic. Waves of social and political unrest in several EMEs have not helped the sentiment of global investors to return in force.

Yields and flows amid the pandemic

Graph 3




LCY= local currency

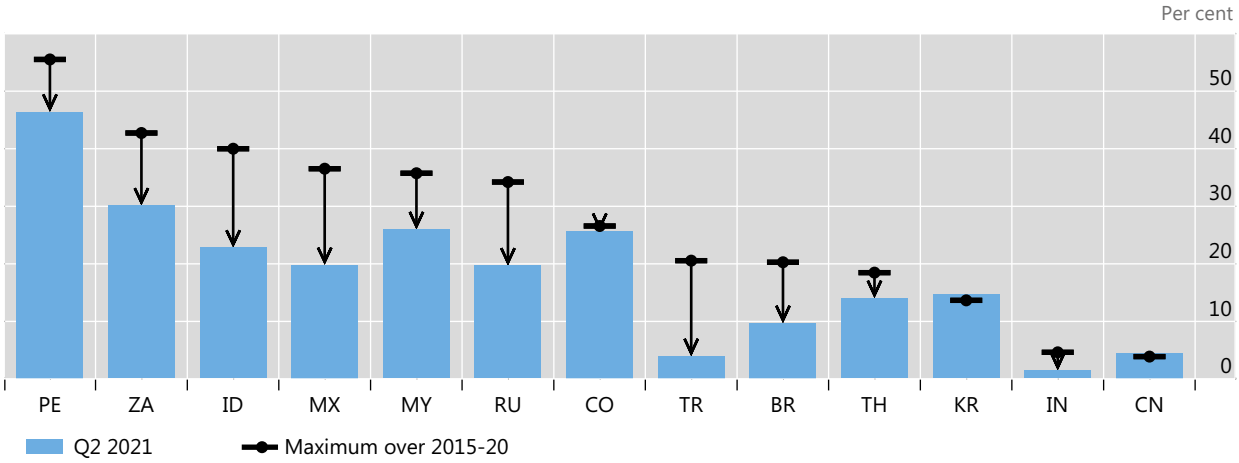
[1] JPMorgan EMBI Global index, stripped spreads. [2] JPMorgan GBI-EM Broad index, yields on traded index. [3] Flows to sovereign foreign currency bond funds. [4] Flows to sovereign local currency bond funds.

Sources: EPFR; JPMorgan Chase; BIS calculations.

The reluctance of global investors to re-enter the emerging market domestic currency bond market is also evident in the following chart, which shows that the proportion of domestic currency bonds held by foreign investors is well below the high-water mark reached in the years before the pandemic. While EME governments have been able to overcome "original sin" by borrowing from global investors in domestic currency, global investors have not returned after the pandemic.

These recent developments underline the importance of the investors' perspective. What are the considerations that investors care about?

Percentage of local currency government bonds held by foreigners Graph 4




Source: Institute of International Finance.

Although many EME sovereigns now routinely borrow in their local currency, global investors measure their returns in terms of US dollars or other major currencies. As such, exchange rate movements could amplify their gains and losses, thereby magnifying the risks they face in meeting obligations in their home currency. In this sense, currency mismatch has not disappeared altogether, but has migrated from the borrower's balance sheet to the investor's balance sheet. Agustín Carstens and I coined the term "original sin redux" to refer to the fluctuations in financial market conditions arising from the shifts in risk appetite of global investors in EME bonds that arise endogenously from currency movements, thereby creating an endogenous link between local currency yields and exchange rate fluctuations.[4]

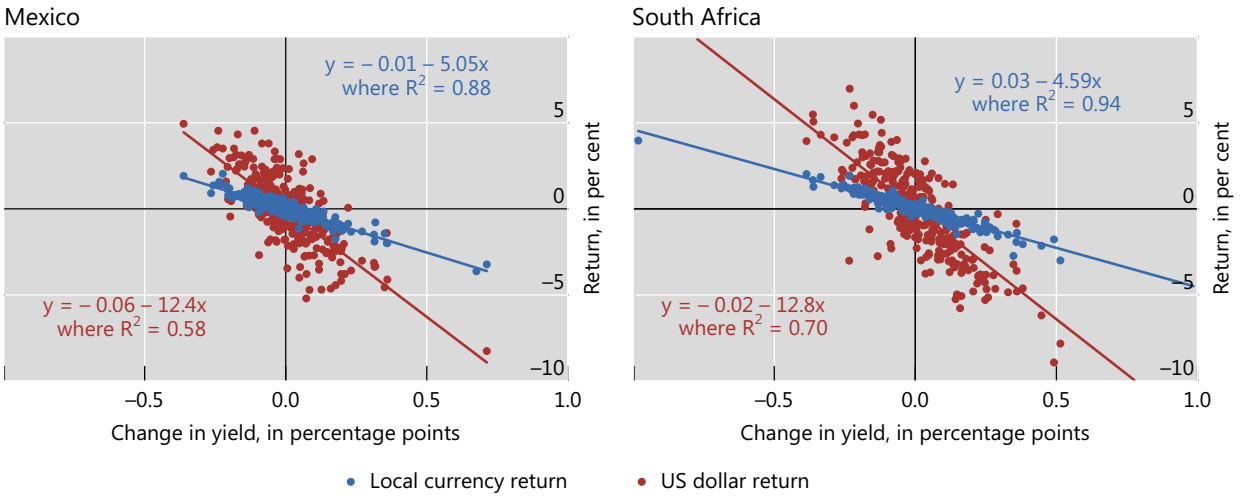
Let me go over the notion of the "duration" of a bond to explain some of the analysis. The duration of a bond is related to its maturity. Formally, duration is defined as the weighted average of the dates of the cash flows that come from the bond, where the weights correspond to the proportion of the value of the bond that is attributable to the cash flows that arrive at that date. So, in the case of a zero coupon bond where the repayment happens all in one go, the duration of the bond is simply its maturity. For ordinary bonds, there is also the periodic payment to the bondholders – the coupons – and so the earlier dates before maturity also have some weight. So, duration tends to be slightly shorter than the maturity of the bond. However, the largest weight in the weighted average is attached to the final repayment of the principal, so that the date when the bond matures receives most of the weight in the weighted average. In short, the duration of a bond is a good measure of how far in the future the payments from a bond arises.

Now, one of the features of bond duration is that it measures the sensitivity of the market price of the bond to changes in its yield. It is a theorem in fixed income analysis that the percentage return from holding the bond to an increase in the yield of the bond is captured by the duration of the

[4] See A Carstens and H S Shin, "Emerging markets aren't out of the woods yet", *Foreign Affairs*, 15 March 2019.

bond. The higher the duration, the more sensitive the price is to shifts in the yield. Since bond prices fall when yields rise, the convention is to take the absolute value as the duration.

Local currency sovereign bond returns[1] Graph 5




[1] Total return on bonds denominated in local currency as weekly change in JPMorgan GBI-EM principal return index in local currency and US dollar terms over January 2013–October 2018.

Sources: JPMorgan Chase; BIS calculations.

One way of estimating duration in practice is to plot the return on a bond to shifts in its yield. Graph 5 illustrates how this can be done for the JPMorgan GBI-EM sovereign bond indices for Mexico and South Africa. The blue dots show the relationship between the return on the bond in local currency terms to changes in the yield. The slope of the line gives the duration of the bond. We see that the slope is around five, indicating that for a 1 percentage point increase in the yield (measured in annual terms), the price of the bond falls by 5%. This plot is consistent with the bond index containing bonds that have maturity slightly longer than five years.

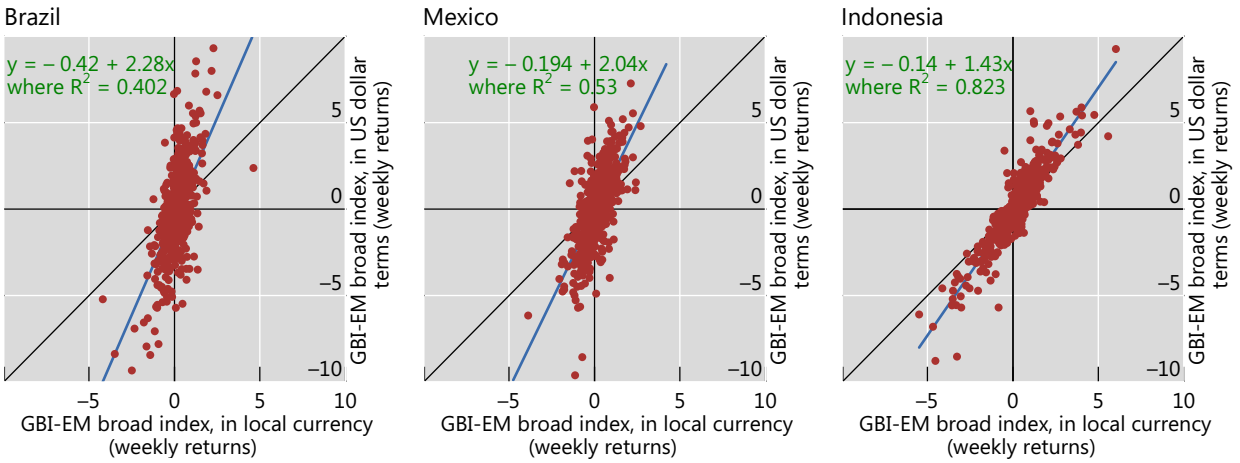
The notable feature in the graph is the red scatter chart, which expresses the return in dollar terms. For the same change in the yields, the return in dollar terms tends to be much more pronounced, both when the bond is increasing in value and when it is decreasing in value. This is because when the price of the bond is increasing, the local currency of the issuer is also appreciating against the dollar, so that the investor who cares about dollar returns "wins twice", as it were. Conversely, when the bond price is falling, the local currency is depreciating against the dollar, so that the investor "loses twice".

This chart points to the importance of keeping track of the exchange rate when considering the returns. Since global investors typically evaluate their returns in terms of their own currencies or dollars, the impact of exchange rate adjustments will need to be taken into account when assessing their portfolio decisions.

One useful analytical device is the slope of the red scatter line relative to the blue scatter line, to indicate the additional sensitivity of the returns in dollar terms as compared with the returns in

local currency terms. I will call this the "duration multiplier", indicating the sensitivity of return in dollar terms as compared with sensitivity in local currency terms. In effect, the exchange rate tends to accentuate returns for the dollar-based investor so that it is as if the investor is holding a bond that is of much longer duration, thereby exposing the investor to greater market risk (Graph 6).

Duration multipliers[1] Graph 6




[1] Total return on bonds denominated in local currency as weekly change in JPMorgan GBI-EM principal return index in local currency and US dollar terms.

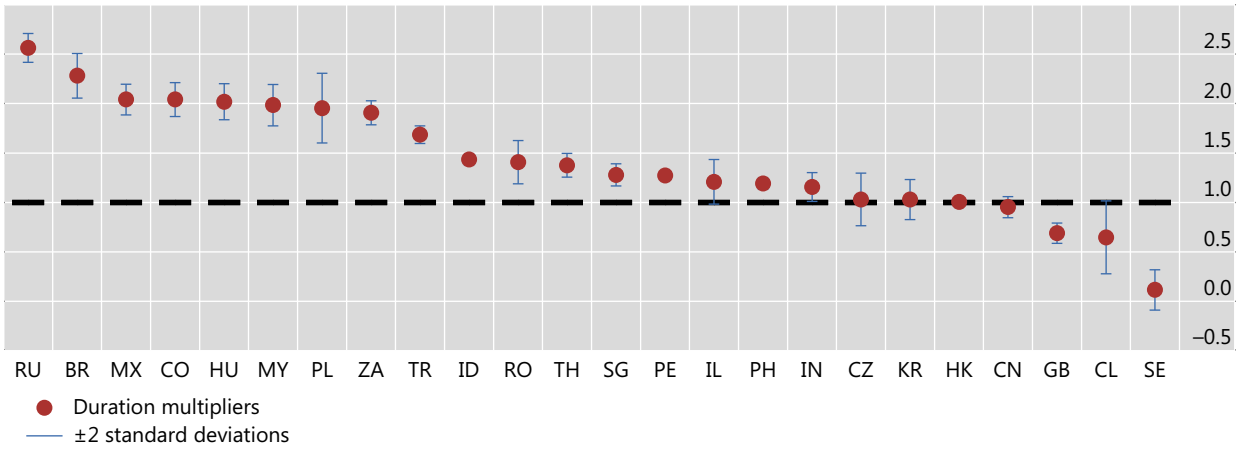
Sources: JPMorgan Chase; BIS calculations.

One possible reason for the correlations we see in these charts is that investors' perceptions and behaviour inject these correlations endogenously into market prices. This link gives rise to feedback between prices and behaviour that generate the correlations endogenously. During tranquil market conditions when EMEs are doing well and bond yields are falling in domestic currency terms, the strong portfolio inflows from global investors would further reinforce the price actions while at the same time adding to the strength of the domestic currency. The converse would hold during stressed times, when portfolio outflows would weaken bond market sentiment, and dollar-denominated returns would be further hit by the depreciation of the local currency.

Ideally, we would hope that EMEs exhibit a duration multiplier that is small, indicating portfolio flows that are less procyclical. However, on the whole (Graph 7), duration multipliers for EME borrowers tend to be well above one, with the large EMEs clustering around two. In other words, the returns in dollar terms tend to be twice as large as the returns in local currency terms, whether positive or negative.

Emerging market economies' duration multipliers[1]

Graph 7




[1] Slope of the fitted line for the US dollar returns on EME local currency government bonds against local currency returns.

Sources: JPMorgan Chase; BIS calculations.

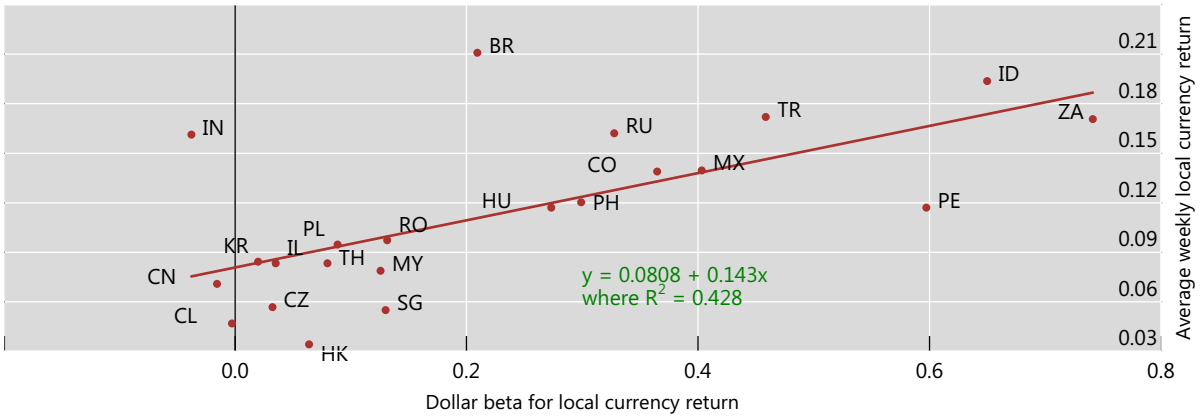
On the other hand, there are countries whose duration multiplier is much smaller, and indeed, they can be below one, indicating that currency movements tend to counteract the returns in local currency terms. You see that these countries are advanced economies, such as Sweden and the United Kingdom. The interesting case is Chile, which has a very low duration multiplier, perhaps accounted for by the large funded domestic pension sector, which can cushion the portfolio outflows.

The duration multiplier is a useful summary indicator of how sensitive a country's bond market is to global sentiment. A higher duration multiplier indicates greater exposure to global factors. Another way to approach the issue is by analogy with an asset pricing exercise, where the exposure to a risk factor is reflected in market prices. The Capital Asset Pricing Model (CAPM) is perhaps the best-known example of this approach, where the sensitivity of an asset's return to the market return – the stock's "beta" – is associated with a higher expected return. The idea is that the higher expected return compensates investors for bearing more of the undiversifiable risk.

In the context of domestic currency emerging market bonds, the broad dollar index plays a similar role to a stock's beta in being a cross-sectional asset pricing factor. As Graph 8 shows, when we consider the broad dollar index as a global factor that enters as a cross-sectional asset pricing factor, we see that those countries whose bonds are more sensitive to the fluctuations of the broad dollar index tend to pay higher nominal yields.

Dollar beta as a cross-sectional risk factor

Graph 8




Source: BIS calculations.

A high dollar beta presents challenges both for the borrower and the investor. For the borrower country, the fluctuations in portfolio flows and nominal yields that follow the ups and downs of the exchange rate can pose difficulties in the conduct of monetary policy, and macroeconomic management more generally. For the investor, the high dollar beta and the high duration multiplier make EME domestic currency bonds a riskier asset class than they are to local investors. It is for these reasons that the procyclical nature of the portfolio flows and the risky nature of the asset class are two sides of the same coin.

Improving the resilience of the bond market will benefit both borrowers and investors. As economists, we could expect Pareto improvements that benefit both the borrowing country and the global investors.

So, what is to be done?

On the part of the borrowers, further development of the domestic investor base would be one element in the strategy towards deep and liquid domestic financial markets, including hedging markets. However, this prescription is tantamount to asking EMEs to become wealthier so that institutional investors have larger asset portfolios. Over the short term, this advice may not be so helpful. More important would be to sustain economic growth by navigating the current challenging global financial landscape. Tackling the pandemic directly is of first-order importance in this regard.

For the investor, some further rethinking of the sources of the procyclicality in portfolio flows may be useful. The factors behind procyclicality in portfolio flows arise partly from the fluctuations in risk appetite dictated by risk-sensitive portfolio allocation models. Portfolio choice reacts to developments, and rightly so.

However, institutional features may also be exacerbating the procyclicality. As we have seen above, the broad dollar index plays the role of a barometer of risk appetite, and part of this can be attributed to the dollar's pre-eminent role as a global currency. There are implications that flow

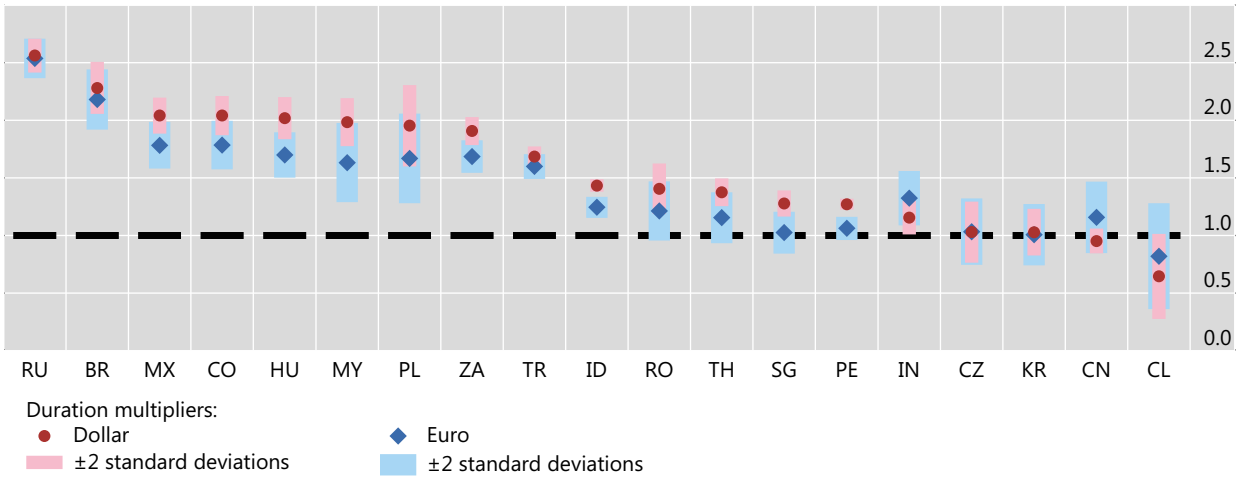
from the dollar's status as the numeraire currency to the way tail risks fluctuate with the ups and downs of the dollar exchange rate.[5]

Closely related to the benchmark role of the dollar is the fact that benchmark bond indices are also built with reference to the dollar. When delegated portfolio managers are compared with bond indices that reference returns in dollar terms, the dollar is hardwired into the performance evaluation. Euro area investors, for instance, who ultimately care about returns in euro terms, may be better off if they were able to set the asset management mandate in euro rather than dollar terms.

Anecdotally, conversations with market participants indicate that benchmarks that refer to currencies other than the dollar may improve measures of fund performance by lowering the systematic risk characteristics of the bond portfolio. To the extent that investors bear less risk, their portfolio allocations may similarly be less procyclical, and thereby mitigate the "risk-on, risk-off" nature of portfolio flows to emerging markets. The currency beta may similarly be reduced.

In that vein, let me conclude with a couple of charts that illustrate how the duration multipliers look when measured in euro and in yen terms. The first compares the duration multiplier in euro terms with that in dollar terms, and the second compares the duration multiplier in yen terms with that in dollar terms.

Dollar and euro duration multipliers for EME local currency[1] Graph 9

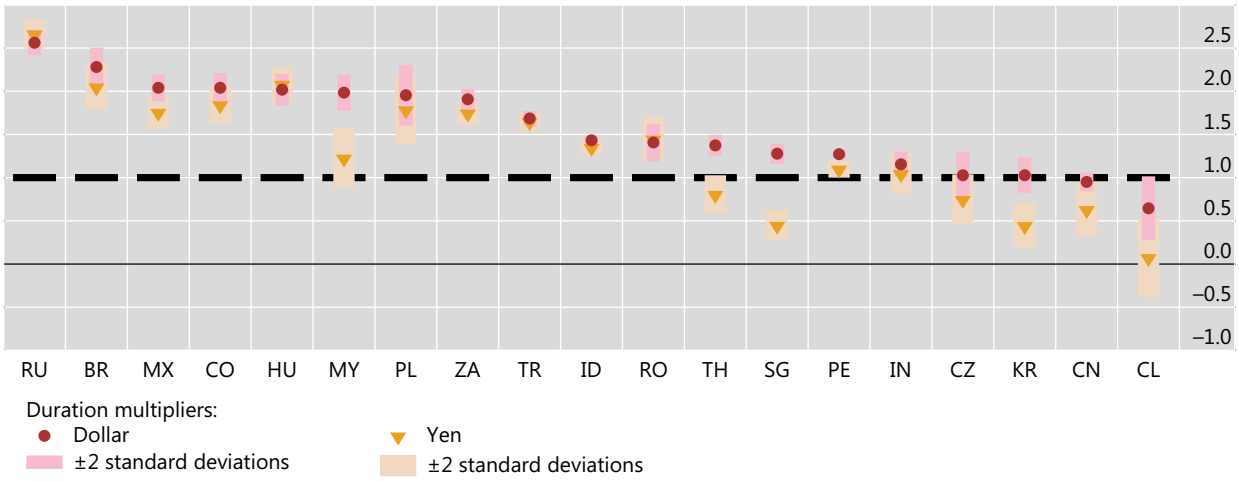



[1] Slope of the fitted line for dollar and euro returns on EME local currency government bonds against local currency returns.

Sources: JPMorgan Chase; BIS calculations.

[5] See B Hofmann, I Shim and H S Shin, "Bond risk premia and the exchange rate", *Journal of Money, Credit and Banking*, December 2020.

Dollar and yen duration multipliers for EME local currency[1] Graph 10




[1] Slope of the fitted line for dollar and yen returns on EME local currency government bonds against local currency returns.

Sources: JPMorgan Chase; BIS calculations.

In both cases, we see that the duration multipliers in terms of the euro and the yen tend to be smaller than the equivalent duration multiplier in dollar terms (Graphs 9 and 10).

What these charts show, interestingly, is that the numeraire currency does matter for the risk properties of an asset class. The choice of numeraire is not neutral in this context because it affects behaviour. Since risk-taking and portfolio choice are endogenous, the correlations in financial markets are also endogenous. The numeraire currency matters because it ultimately affects behaviour and hence the market outcome itself.

To the extent that a euro area-based investor would prefer to give a performance mandate to the asset manager in terms of an index based on returns in euro terms, there may be scope for a Pareto improvement, where both the investor and the borrowing country may benefit. Shifting to new benchmarks will take time, but thinking more deeply about the properties of benchmarks and their impact on behaviour may be worthwhile given the challenges that lie ahead.

To be sure, these tweaks in the institutional features of the asset management sector will have only a limited impact within the broader context of the huge challenges faced by EMEs as we exit from the pandemic shock and its aftermath. However, every little helps. And these ideas are notable, because they are the rare initiatives that address the decision frameworks affecting investors, rather than focusing on the borrowers. Being able to overcome "original sin redux" as well as "original sin" would be a big prize indeed.