



WHITE PAPER

EM QUALITY LOCAL CURRENCY DEBT: ANOTHER PIECE OF THE PUZZLE

Higher yield and similar defensiveness vs. developed market government bonds

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EXECUTIVE SUMMARY

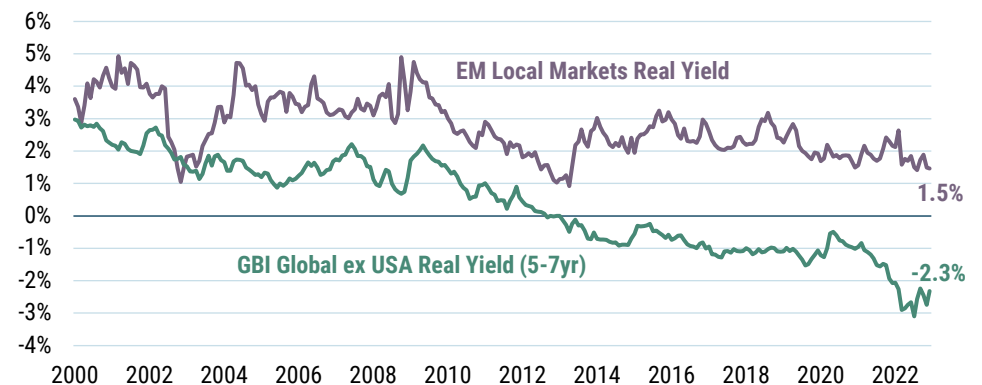
We believe a quality-tilted emerging market local currency debt portfolio offers the benefits of accessing emerging market risk premia while preserving the defensive properties of developed market bonds. As an alternative to non-U.S. developed market exposure, EM quality local currency debt¹ offers a viable solution to investors that seek EM exposure but may not be ready to embrace the full spectrum of volatility and idiosyncratic risk inherent to the asset class. EM quality debt can serve as a core EM debt exposure and can be combined with additional sources of EM debt returns, thus offering investors an integrated solution that can be tailored to meet their specific objectives. Indeed, we believe GMO's EM Quality Local Currency Debt Strategy makes a compelling complement or substitute to DM bond exposure.

Introduction

While EM debt investing offers potentially significant real yields, it also requires a considerable focus on risk mitigation. This is particularly true as the challenges of investing in this asset class are regularly complicated by global, regional, and local political and non-economic shocks.

Meanwhile, inflation-adjusted DM rates have experienced a prolonged period of secular decline during the last two decades, thus forcing investors to choose between holding negative-yielding domestic debt or reaching into riskier sub asset classes for yield.² **Emerging markets, on the other hand, have consistently offered higher real yields relative to developed markets since 2003, presenting investors with one possible piece of the asset allocation puzzle.** In addition, even as DM rates have begun to rise, there continues to be a widening EM/DM real yield gap when paired with inflation, as shown in Exhibit 1.

EXHIBIT 1: THE EM/DM REAL YIELD GAP CONTINUES TO WIDEN



As of 12/31/2022 | Sources: J.P. Morgan, Consensus Economics, GMO

Despite the allure of attractive real yields, investors are often understandably cautious when it comes to investing in emerging markets. Returns can be affected by idiosyncratic episodes of excessive currency volatility, capital controls, default risk, and liquidity events that are much rarer occurrences in developed markets. Adding to that, developed markets typically enjoy a “flight to quality” and offer valuable protection in risk-off environments.

¹ Our analysis is specific to local currency emerging market bonds from a USD investor perspective and covers the period June 2003 through December 2022. For the purposes of this paper, all references to “EM quality debt” refer to EM quality local currency debt. Equivalent results from non-USD perspectives, which highlight the consistent themes of EM quality’s DM-like defensive properties and EM-like premia, are outlined in Appendix A.

² The negative yielding market segment increased dramatically since 2014, peaking at about 30% of the Bloomberg Global Aggregate Index by mid-2019.

The concept of quality in EM debt allows us to connect these two themes and ask, can we structure a portfolio that balances the risks and rewards of EM debt in such a way that investors reap the benefits of excess EM yields without sacrificing DM-like defensiveness? We believe the answer is a resounding yes.

GMO has a long history in both EM debt investing and studying the idea of quality. Based on our experience and research, **we believe that an EM quality local currency debt strategy presents a compelling option to investors seeking exposure in emerging markets either as a complement to or in lieu of DM bond exposure.** As we will demonstrate in this paper, such a strategy offers the benefits of access to EM risk premia while preserving many defensive properties of DM bonds.

Quality in Emerging Market Debt – A Model Portfolio

In emerging market debt, we believe quality means having intrinsic strength measured by strong macroeconomic fundamentals and explicit defensive properties.

We define higher quality emerging markets as those with low inflation, low fiscal deficits, and a low need for external financing, as well as those with high savings and equity market capitalizations. Furthermore, given our focus on preserving the role of diversification from EM debt, we include in our definition countries with a low sensitivity to broad equity risk.³ We find that these countries generally exhibit lower return volatility while still compensating investors for employing capital in emerging markets versus their developed counterparts.⁴

To create a model portfolio using this definition, we first rank countries relative to their own three-year histories and rank the top and bottom thirds across the investible universe on each of the six quality factors. Countries that are in the top third on a given factor receive a “vote” and those with two or more positive votes are added to the model portfolio each month. This applies after the countries in the highest inflation category are excluded regardless of the number of votes from the other factors.⁵ For example, at the end of 2020, our quality process designated China a quality country based on its low fiscal deficit, high savings and market capitalization rates, and its pronounced countercyclical nature. On the other hand, Russia fell into the low-quality category because of its poor relative inflation measure, despite its attractive rankings on low external financing needs and high savings factors.

Our resulting model portfolio of equally distributed quality emerging markets is shown in Exhibit 2.⁶ Note that country inclusion and exclusion decisions are equally important. Higher yielding countries such as South Africa, Brazil, Mexico, Russia, Turkey, and Indonesia did not exceed our systematic quality barometer at any point during the period we examined and have therefore been excluded from the portfolio. To put this in context, by our measure about 60% of the JPM GBI-EM Global Diversified Index was exposed to low-quality EM countries at the end of 2021. From a trading perspective, we estimate that our quality identification process reduces a universe currently valued at \$4.1 trillion to \$3.7 trillion.⁷ Importantly, we conclude that our EM quality process leaves a large investible part of the broad EM universe available to allocators.

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We measure sensitivity to equity risk by the beta of the weekly JPM GBI-EM Global Diversified country sub-index hedged returns or a country's 10-year swap rate if the former is not available over a 60-day window.

4

We validated through equal-weighted factor portfolios that each of these factors has a stable, consistent, and intuitive relationship with future returns.

5

We considered alternative methods of structuring a quality-tilted EM debt model portfolio by aligning quality with credit ratings as well as employing statistical methods. We discuss the results and drawbacks of using the sovereign credit ratings in Appendix B. We separately corroborated the results of our dynamic process based on macroeconomic fundamentals described in this paper with principal component analysis and found that this purely statistical approach, with the benefit of hindsight, produced a broadly similar basket of quality EM countries. More details are available upon request.

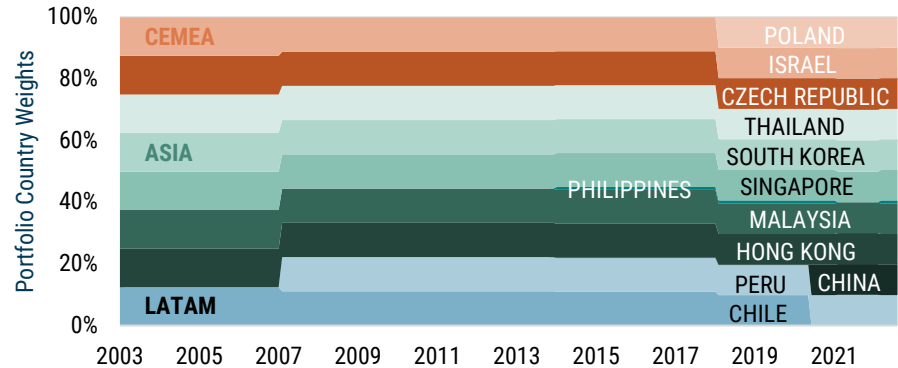
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Due to poor market liquidity and accessibility considerations, we capped the weights in the model portfolio at 1% in the Philippines.

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See Appendix C.

EXHIBIT 2: GMO EM QUALITY DEBT MODEL PORTFOLIO

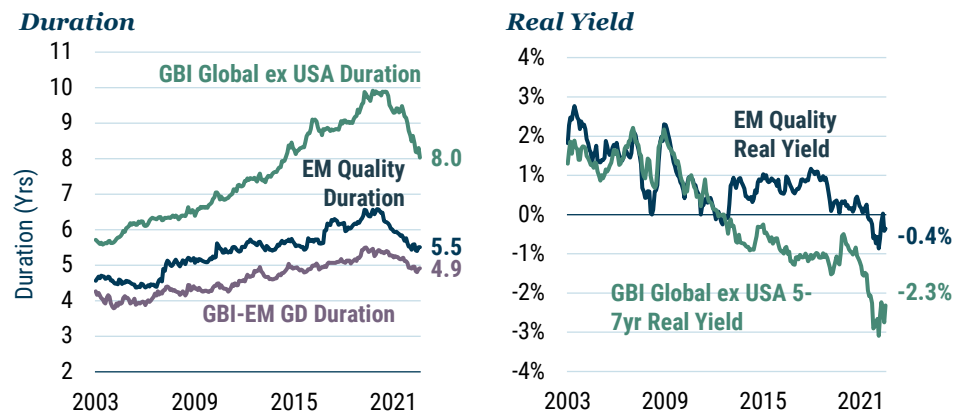


Period: June 2003 – December 2022 | Source: GMO

EM Quality Local Currency Debt Characteristics and Risk/Reward Profile

Now that we have established our EM quality debt model portfolio, we can directly evaluate its yield and diversification properties. Indeed, the model portfolio exhibits a higher real yield relative to our non-U.S. DM proxy (JPM GBI Global ex-USA 5-7 Years Index) over the period we examined and especially in the last decade. Not surprisingly, the duration of the model portfolio lies between the EM and broad DM indices, but closer to EM as shown in Exhibit 3. The JPM GBI Global ex-USA Index is about 4 years longer in duration than the EM quality debt model portfolio. We adjust returns by the ratio of the duration so that both series can be compared in units of similar duration. In Exhibits 4 and 5, we compare returns of the EM quality debt model portfolio to “DM*Adjusted,” where “adjusted” refers to duration-adjusted returns.⁸

EXHIBIT 3: EM QUALITY DEBT HAS HIGHER REAL YIELD THAN DM WITH DURATION SIMILAR TO EM



Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

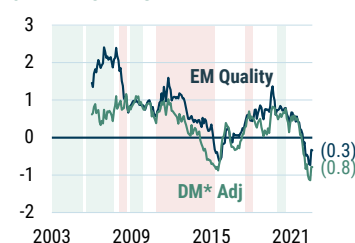
When investing in emerging markets, it is important to consider the outsized role that EM currencies can play in a portfolio’s volatility and downside risk. We first consider an unhedged variation of our EM quality debt model portfolio. As shown in Exhibit 4, the unhedged model portfolio outperforms both the local currency GBI EM Global Diversified portfolio and the original barometer, the DM*Adjusted portfolio in both absolute and relative risk/reward terms for most periods.

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We adjust the JPM GBI Global ex-USA monthly returns with the ratio of quality EM and DM durations and call it DM*Adjusted.

EXHIBIT 4: UNHEDGED EM QUALITY DEBT RESULTS

3-YEAR ROLLING IR



GMO GBI-EMGD Expected Spot FX Return



JUNE 2003 - DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	4.2%	4.4%	1.5%	2.9%
Ann Std Dev:	7.3%	11.8%	6.0%	4.9%
Risk/Reward:	0.6	0.4	0.3	0.6

10 YR RETURNS THROUGH DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	0.3%	-2.1%	-1.4%	0.8%
Ann Std Dev:	7.0%	11.3%	5.2%	4.4%
Risk/Reward:	0.0	-0.2	-0.3	0.2

5 YR RETURNS THROUGH DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	-0.5%	-2.6%	-2.5%	0.3%
Ann Std Dev:	7.6%	11.6%	5.6%	5.0%
Risk/Reward:	-0.1	-0.2	-0.5	0.1

Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

One might wonder whether the results are particularly sensitive to the state of EM FX valuation. Is it the case that unhedged EM quality local currency debt only outperforms in a secularly attractive environment for EM FX? To answer this, we overlay our proprietary GMO EM FX valuation metric, which rates the basket of EM currencies as rich or cheap.⁹ Levels of rich and cheap are calibrated over long periods and currencies are considered expensive when expected spot returns are less than -5%, neutral when the expected spot returns lie between -5% and 0%, and cheap if the expected spot returns move above 0%. We have shaded the top chart in Exhibit 4 with green to identify periods of cheap, white for neutral, and pink for rich expected EM FX. Clearly, we can conclude that the **unhedged EM quality debt model portfolio outperformed DM*Adjusted regardless of the state of EM FX valuations and that it may therefore offer an attractive alternative to the low real rates challenge investors are facing in developed markets.**

Exhibit 4 also demonstrates the potential of complementing domestic rate exposure with EM currency exposure that does not have the currency risk of the more idiosyncratic EM markets. The volatility of EM quality in every observed period is lower than that of the GBI-EM Global Diversified Index, reinforcing the notion that quality can be achieved through country selection and showcasing another way investors could apply an EM quality debt strategy.¹⁰

Avoiding EM Currency Risk: The FX-Hedged Results

Next, for those EM investors seeking to immunize EM currency risk entirely, we look to a hedged EM quality debt model portfolio. Once currency risk is hedged using a careful assessment of hedging costs, we are left only with interest rate premia. As we see in Exhibit 5, the hedged EM quality debt model portfolio performs on par with its DM*Adjusted hedged counterpart in absolute return terms. Results are more mixed on a risk/reward basis, depending on the period. In general, the hedged EM quality debt model portfolio tends to outperform in periods of a widening real yield gap between EM and DM and when hedging costs are low or decreasing.

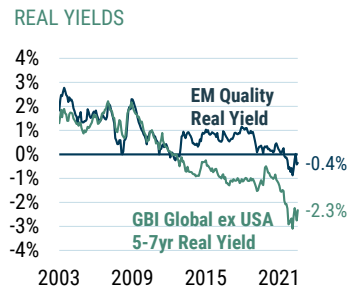
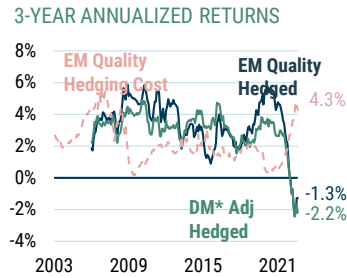
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Please refer to the latest [GMO Quarterly EM Debt Update](#) for a detailed view of our valuation metrics.

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The attribution results shown in Appendix D reinforce our findings that strong EM FX carry drives outperformance of the unhedged returns, especially over longer time periods. Hence, carry return more than offsets any currency depreciation for these quality EM countries.

EXHIBIT 5: FX-HEDGED EM QUALITY DEBT RESULTS



JUNE 2003 - DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	2.8%	3.3%	2.4%	2.9%
Ann Std Dev:	3.0%	4.5%	2.3%	4.9%
Risk/Reward:	0.9	0.7	1.0	0.6

10 YR RETURNS THROUGH DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	1.6%	0.6%	1.5%	0.8%
Ann Std Dev:	3.2%	4.3%	2.6%	4.4%
Risk/Reward:	0.5	0.1	0.6	0.2

5 YR RETURNS THROUGH DECEMBER 2022

	<i>EM Quality</i>	<i>GBI-EM GD</i>	<i>DM* Adj</i>	<i>GBI Global: United States 5 - 7 Years</i>
Ann Return:	1.3%	0.1%	0.2%	0.3%
Ann Std Dev:	3.7%	4.6%	2.9%	5.0%
Risk/Reward:	0.4	0.0	0.1	0.1

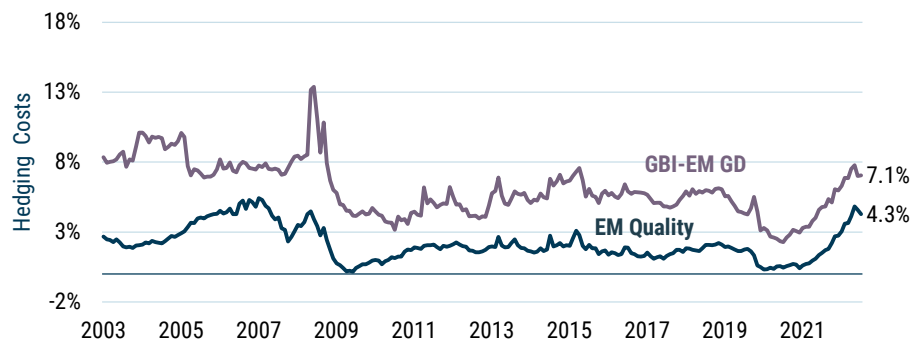
Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

Hedging costs¹¹ can be material and idiosyncratic within emerging markets and potentially punitive to EM quality debt performance versus developed markets, as seen in Exhibit 5. Those costs have trended down since 2003 but have had episodic surges, as tracked by the pink dashed line in the annualized return chart above. Exhibit 6 shows that the idiosyncratic sovereign risk reflected in hedging costs is much lower in the EM quality debt model portfolio than it is in broader emerging markets.

EXHIBIT 6: LOWER HEDGING COSTS IN EM QUALITY DEBT PORTFOLIO

Hedging Cost (FX carry + US libor)



Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

EM Quality Debt Defensiveness

Finally, we focus on where EM quality sits on a scale of “very defensive” (i.e., DM debt exposure levels) to “risky” (i.e., EM local debt exposure levels) to help us evaluate its role in a multi-asset portfolio.

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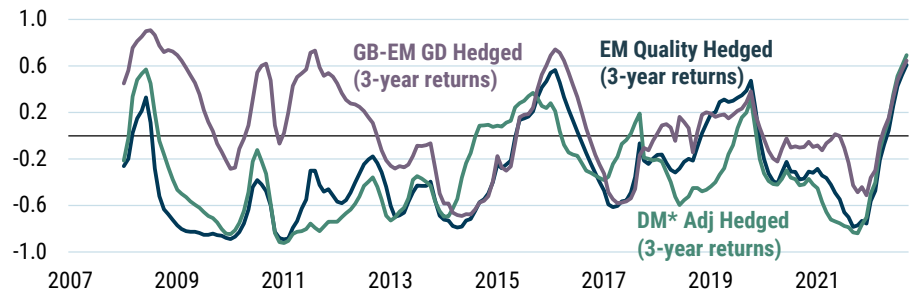
Hedging costs are defined as FX carry plus U.S. 3-month Treasury Bill. See Appendix E for country-level details.

A direct measure of defensiveness is the extent to which both hedged and unhedged EM quality debt model portfolios correlate to various proxy measures of equity risk. We focus on correlations, average returns in up and down equity markets, and downside risk. The top chart in Exhibit 7 shows 2-year rolling correlations of the 3-year returns. Here we see that the currency-hedged EM quality debt model portfolio is as defensive as its DM*Adjusted counterpart with respect to global equity. The EM quality FX-hedged portfolio returns are also meaningfully more defensive than broad EM local debt FX-hedged exposure. More importantly, the bar chart in Exhibit 7 demonstrates that the average returns of the hedged EM quality debt model portfolio are positive during periods of observed drawdowns in equity markets. During these periods, the FX-hedged EM quality debt exposure exhibits limited drawdown risk that is lower than that of the broad EM universe but about 2.5% higher than that of the DM complex. It is interesting to note that unhedged EM quality debt exposure does not exacerbate the downside risk. On the contrary, during market downturns the unhedged EM quality debt portfolio slightly outperforms the DM complex and limits losses versus the broad EM complex by 15%.

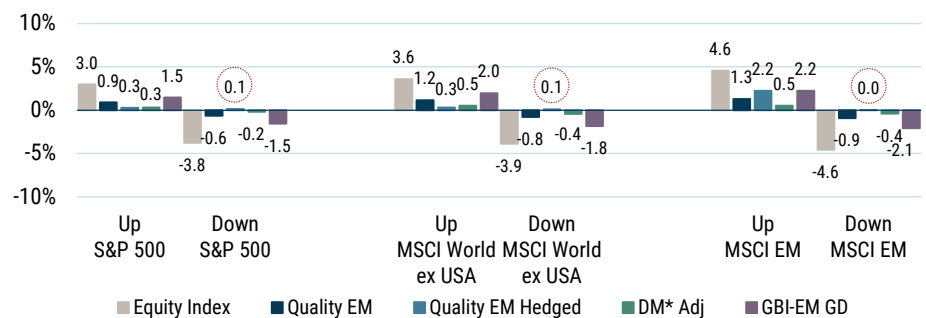
In summary, the strong negative correlation of EM quality local currency debt to equity risk is a valuable feature of a diversified portfolio at times of market weakness. Also in the unhedged space, a stable and robust carry can offer protection against equity downturns.¹²

EXHIBIT 7: BOTH HEDGED AND UNHEDGED EM QUALITY DEBT OFFER DEFENSIVENESS PROPERTIES

2-Year Correlation with S&P 500



Average Monthly Returns



	EM Quality Hedged	GBI-EM GD Hedged	DM* Adj Hedged	EM Quality	DM* Adj	GBI-EM GD	MSCI EM	S&P 500	MSCI World ex USA
Max Drawdown (quarterly returns)	-11.6%	-16.4%	-9.1%	-22.6%	-23.2%	-27.0%	-53.3%	-47.7%	-51.8%
Max Drawdown Date	Sep-22	Sep-22	Dec-22	Sep-22	Sep-22	Dec-15	Dec-08	Mar-09	Mar-09

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For more details on monthly and medium-term correlation results please refer to Appendix F.

Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan, Rimes

Past performance, whether model or actual, is no guarantee of future results.



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Ms. Courmes is engaged in portfolio management and research for GMO's Emerging Country Debt team. She is primarily

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Riti Samanta

Dr. Samanta is portfolio manager for GMO's Systematic Credit/LDI and Multi-Sector Fixed Income Strategies and a

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Mina Tomovska

Ms. Tomovska is an associate portfolio strategist focusing on GMO's fixed income capabilities. Previously

at GMO, she was a member of the investment analysis team. Prior to joining GMO in 2009, she was a senior associate account manager at State Street Corporation. Ms. Tomovska earned her bachelor's degree in Business Administration and Economics from American University in Bulgaria and her MBA from Boston University. She is a CFA charterholder.

Conclusion

GMO's EM Quality Local Currency Debt Strategy can offer investors a viable alternative to non-U.S. developed market exposure. It can serve as a solution for investors that are seeking exposure to emerging markets but are not willing or able to adopt the full spectrum of volatility and idiosyncratic risks of the broad EM asset class. Our analysis has been from a USD perspective and as noted previously, similar results are shown for non-USD based investors in Appendix A.

The EM Quality Local Currency Debt Strategy can serve as a core EM debt exposure or be combined with additional sources of EM debt returns – such as currency, rate, and security selection – to provide an integrated solution that can be tailored to meet specific investment objectives.

- **Security selection:** Within EM debt, GMO is known for our unique, bottom-up approach and our ability to generate excess alpha from security selection in our flagship external EM debt and local EM debt products. We believe that complementing an EM quality debt portfolio with this process can deliver additional security selection alpha from investing in more sophisticated instruments such as inflation-linked bonds, interest rate derivatives, quasi-sovereigns, and supranational debt.
- **Currency and rates selection:** We also have long-standing relative value programs integrated in our EM debt products that use sophisticated quantitative models to take advantage of investment opportunities while remaining overall beta neutral. These can similarly be applied to enhance a core EM quality exposure.

Ultimately, the full power of the EM Quality Local Currency Debt Strategy can only be realized by partnering with clients to develop solutions that meet their specific investment objectives. When it comes to designing a portfolio that meets the unique challenges facing EM debt investors, we believe the defensive and yield capture properties of EM quality debt are key pieces of the investment puzzle.

Disclaimer

The views expressed are the views of Victoria Courmes, Riti Samanta, and Mina Tomovska through the period ending May 2023, and are subject to change at any time based on market and other conditions. This is not an offer or solicitation for the purchase or sale of any security and should not be construed as such. References to specific securities and issuers are for illustrative purposes only and are not intended to be, and should not be interpreted as, recommendations to purchase or sell such securities.

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APPENDIX A

Non-USD Investor Perspectives

Throughout this appendix we define the “G3 Adj Index” as equal-weighted GBI Global United States, GBI Global Japan, and GBI Global EMU ex-Greece, Portugal, Spain, and Ireland, adjusted by the duration ratio of the EM quality local currency debt model portfolio and the equal-weighted index.

EM QUALITY DEBT RESULTS – AUSTRALIAN DOLLARS (AUD)

From an Australian dollar base currency perspective, the unhedged EM quality debt model portfolio has outperformed the G3 complex on an absolute basis over the observed period thus offering a compelling alternative to G3 exposure. On the other hand, the hedged EM quality debt model portfolio affords a complement to domestic bond exposure given its higher risk/reward profile and negative correlation to global equity risk.

UNHEDGED

HEDGED

JUNE 2003 - DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Australia 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	4.0%	4.1%	1.6%	4.4%	4.3%	4.3%	4.0%
Ann Std Dev:	8.6%	8.0%	9.6%	4.2%	3.0%	4.4%	2.7%
Risk/Reward:	0.5	0.5	0.2	1.0	1.4	1.0	1.5

10-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Australia 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	4.6%	2.2%	2.6%	2.3%	2.1%	1.2%	1.8%
Ann Std Dev:	7.0%	8.2%	7.2%	3.9%	3.2%	4.3%	2.6%
Risk/Reward:	0.7	0.3	0.4	0.6	0.7	0.3	0.7

5-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Australia 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	1.2%	1.0%	-0.6%	0.2%	-0.2%	-0.9%	-0.7%
Ann Std Dev:	7.7%	9.0%	7.8%	4.9%	4.1%	4.9%	3.1%
Risk/Reward:	0.2	0.1	-0.1	0.0	0.0	-0.2	-0.2

3-YEAR RETURN CORRELATIONS (AUD)

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	GBI-EM GD	G3 Adj	GBI Global: Australia 5 - 7 Years	MSCI EM	S&P 500	MSCI World ex USA
EM Quality Hedged	1.0									
GBI-EM GD Hedged	0.9	1.0								
G3 Adj Hedged	0.9	0.8	1.0							
EM Quality	0.2	0.0	0.2	1.0						
GBI-EM GD	0.4	0.5	0.4	0.6	1.0					
G3 Adj	0.1	-0.2	0.2	0.9	0.4	1.0				
GBI Global: Australia 5 - 7 Years	1.0	0.8	0.9	0.3	0.5	0.3	1.0			
MSCI EM	-0.2	0.1	-0.2	0.1	0.4	-0.3	-0.3	1.0		
S&P 500	-0.4	-0.5	-0.5	0.4	-0.2	0.2	-0.3	0.2	1.0	
MSCI World ex USA	-0.4	-0.3	-0.4	0.4	0.2	0.0	-0.4	0.7	0.8	1.0

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	G3 Adj	GBI-EM GD	MSCI EM	S&P 500	MSCI World ex USA
Max Drawdown (quarterly returns):	-12.3%	-16.8%	-9.5%	-17.3%	-24.1%	-18.0%	-41.2%	-33.2%	-39.7%
Max Drawdown Date:	Sep-22	Sep-22	Dec-22	Mar-22	Dec-10	Jun-22	Dec-08	Jun-09	Dec-11

Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

EM QUALITY DEBT RESULTS – EUROS (EUR)

From a euro base currency perspective, unhedged EM quality debt could be a viable complement to German bunds given its higher returns on absolute and risk-adjusted bases while acknowledging its higher volatility profile compared to domestic rates. EM quality rates (FX-hedged results) have performed on par with their DM counterparts, but more importantly, the strong EM quality FX carry further benefits investors looking for an alternative to a top-3 DM equal-weighted exposure.

UNHEDGED

HEDGED

JUNE 2003 - DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Germany 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	4.7%	4.9%	2.1%	2.3%	1.9%	2.3%	1.9%
Ann Std Dev:	6.7%	9.0%	6.2%	3.9%	3.0%	4.4%	2.6%
Risk/Reward:	0.7	0.5	0.3	0.6	0.7	0.5	0.7

10-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Germany 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	2.4%	0.1%	0.7%	-0.5%	0.2%	-0.8%	0.3%
Ann Std Dev:	6.0%	9.2%	4.9%	3.7%	3.2%	4.3%	2.5%
Risk/Reward:	0.4	0.0	0.1	-0.1	0.1	-0.2	0.1

5-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Germany 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	1.9%	-0.2%	-0.1%	-2.7%	-0.7%	-1.9%	-1.1%
Ann Std Dev:	4.9%	8.7%	4.5%	4.2%	3.6%	4.6%	2.8%
Risk/Reward:	0.4	0.0	0.0	-0.6	-0.2	-0.4	-0.4

3-YEAR RETURN CORRELATIONS (EUR)

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	GBI-EM GD	G3 Adj	GBI Global: Germany 5 - 7 Years	MSCI EM	S&P 500	MSCI World ex USA
EM Quality Hedged	1.0									
GBI-EM GD Hedged	0.9	1.0								
G3 Adj Hedged	0.9	0.8	1.0							
EM Quality	0.8	0.8	0.7	1.0						
GBI-EM GD	0.7	0.9	0.6	0.8	1.0					
G3 Adj	0.7	0.5	0.7	0.8	0.5	1.0				
GBI Global: Germany 5 - 7 Years	0.9	0.8	0.9	0.8	0.7	0.8	1.0			
MSCI EM	0.0	0.4	-0.1	0.2	0.5	-0.3	0.0	1.0		
S&P 500	-0.4	-0.3	-0.4	0.0	-0.3	-0.2	-0.3	0.1	1.0	
MSCI World ex USA	-0.3	-0.1	-0.3	0.0	0.0	-0.5	-0.3	0.7	0.7	1.0

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	G3 Adj	GBI-EM GD	MSCI EM	S&P 500	MSCI World ex USA
Max Drawdown (quarterly returns):	-13.6%	-18.3%	-10.6%	-10.7%	-12.1%	-15.9%	-50.9%	-43.8%	-49.6%
Max Drawdown Date:	Sep-22	Sep-22	Dec-22	Dec-13	Dec-22	Sep-15	Dec-08	Mar-09	Mar-09

Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

EM QUALITY DEBT RESULTS – CANADIAN DOLLARS (CAD)

From a Canadian dollar currency perspective, the unhedged EM quality debt model portfolio has outperformed the G3 equal-weighted complex and domestic bonds on an absolute basis. The FX-hedged EM quality debt exposure is on par with G3-hedged for all periods and meaningfully better than the home base currency rates over the past 10 years. In general, we notice that the EM quality debt model portfolio outperforms G3 Adj regardless of the EMFX valuations,¹³ thus offering a compelling solution to the low DM real rates problem. This relative outperformance is driven by a stable and robust carry which can also offer protection against equity downturns. Furthermore, the low correlation of the EM quality debt to equity risk can help a diversified portfolio at times of market weakness.

UNHEDGED

HEDGED

JUNE 2003 - DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Canada 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	4.2%	4.3%	1.8%	3.1%	2.8%	3.0%	2.6%
Ann Std Dev:	7.9%	9.2%	8.2%	3.9%	3.0%	4.4%	2.6%
Risk/Reward:	0.5	0.5	0.2	0.8	0.9	0.7	1.0

10-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Canada 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	3.4%	1.0%	1.6%	0.9%	1.5%	0.5%	1.3%
Ann Std Dev:	6.8%	9.0%	6.5%	4.0%	3.2%	4.4%	2.5%
Risk/Reward:	0.5	0.1	0.2	0.2	0.5	0.1	0.5

5-YEAR RETURNS THROUGH DECEMBER 2022

	EM Quality	GBI-EM GD	G3-Adj	GBI Global: Canada 5 - 7 Years	EM Quality	GBI-EM GD	G3-Adj
Ann Return:	1.1%	-1.0%	-0.6%	0.4%	1.0%	-0.3%	0.1%
Ann Std Dev:	6.4%	8.8%	6.1%	4.4%	3.7%	4.6%	2.8%
Risk/Reward:	0.2	-0.1	-0.1	0.1	0.3	-0.1	0.0

3-YEAR RETURN CORRELATIONS (CAD)

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	GBI-EM GD	G3 Adj	GBI Global: Canada 5 - 7 Years	MSCI EM	S&P 500	MSCI World ex USA
Quality EM Hedged	1.0									
GBI-EM GD Hedged	0.8	1.0								
G3 Adj Hedged	0.9	0.7	1.0							
Quality EM	0.6	0.3	0.7	1.0						
GBI-EM GD	0.7	0.8	0.7	0.5	1.0					
G3 Adj	0.5	0.1	0.6	0.9	0.3	1.0				
GBI Global: Canada 5 - 7 Years	0.8	0.7	0.9	0.5	0.7	0.4	1.0			
MSCI EM	-0.1	0.3	-0.2	-0.3	0.2	-0.6	-0.1	1.0		
S&P 500	-0.3	-0.4	-0.3	0.0	-0.6	-0.1	-0.6	0.0	1.0	
MSCI World ex USA	-0.4	-0.2	-0.3	-0.1	-0.3	-0.4	-0.4	0.6	0.7	1.0

	EM Quality Hedged	GBI-EM GD Hedged	G3 Adj Hedged	EM Quality	G3 Adj	GBI-EM GD	MSCI EM	S&P 500	MSCI World ex USA
Max Drawdown (quarterly returns):	-11.7%	-16.3%	-8.9%	-16.9%	-18.7%	-21.2%	-41.6%	-36.1%	-42.2%
Max Drawdown Date:	Sep-22	Sep-22	Dec-22	Jun-22	Sep-22	Jun-22	Dec-08	Mar-09	Mar-09

Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

APPENDIX B

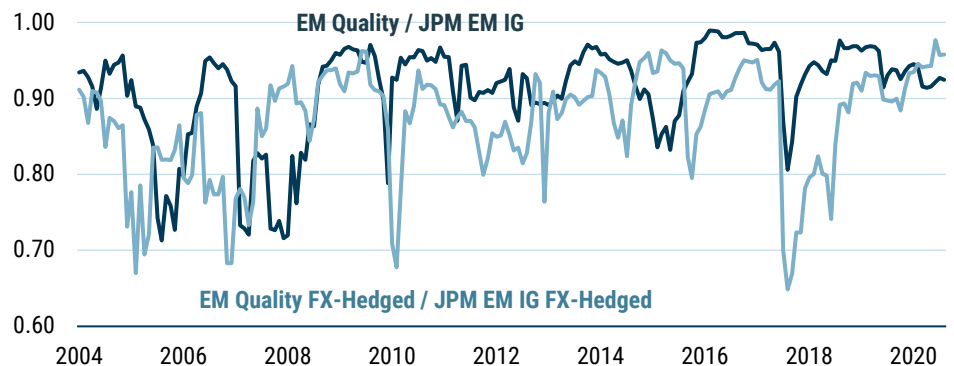
Credit Ratings as an Alternative Quality Metric

EM CREDIT RATINGS

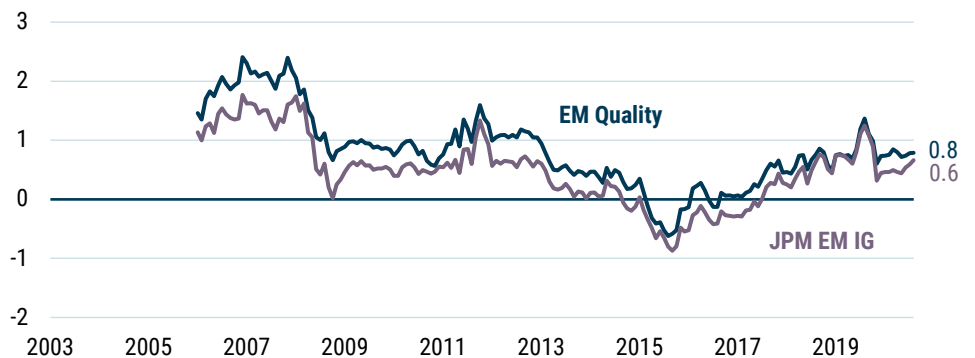
Another candidate for gaining DM-like exposure within the EM local debt space might be an index whose construction is based on sovereign credit ratings. Simply put, we can carve out the investment-grade countries of the broad EM universe to avoid “bad players.” While credit ratings are backward looking and sometimes slow to adjust to changing fundamentals, they provide a broadly accepted framework for assessing countries’ credit worthiness.

In the charts below, we refer to this index as the JPM EM IG Index and thank our partners at J.P. Morgan for constructing it for us and providing the data. As we would expect, the correlation between the EM quality debt model portfolio and the ratings-based index is reasonably high, hovering between 80% and 90%. Our analysis shows that the unhedged EM quality debt portfolio delivered superior risk-adjusted results consistently over the period from June 2003 through December 2020, which is in line with extracting a quality premium related to but more refined than relying entirely on backward-looking ratings measures.

1-YEAR ROLLING CORRELATION



3-YEAR RISK/REWARD RATIO



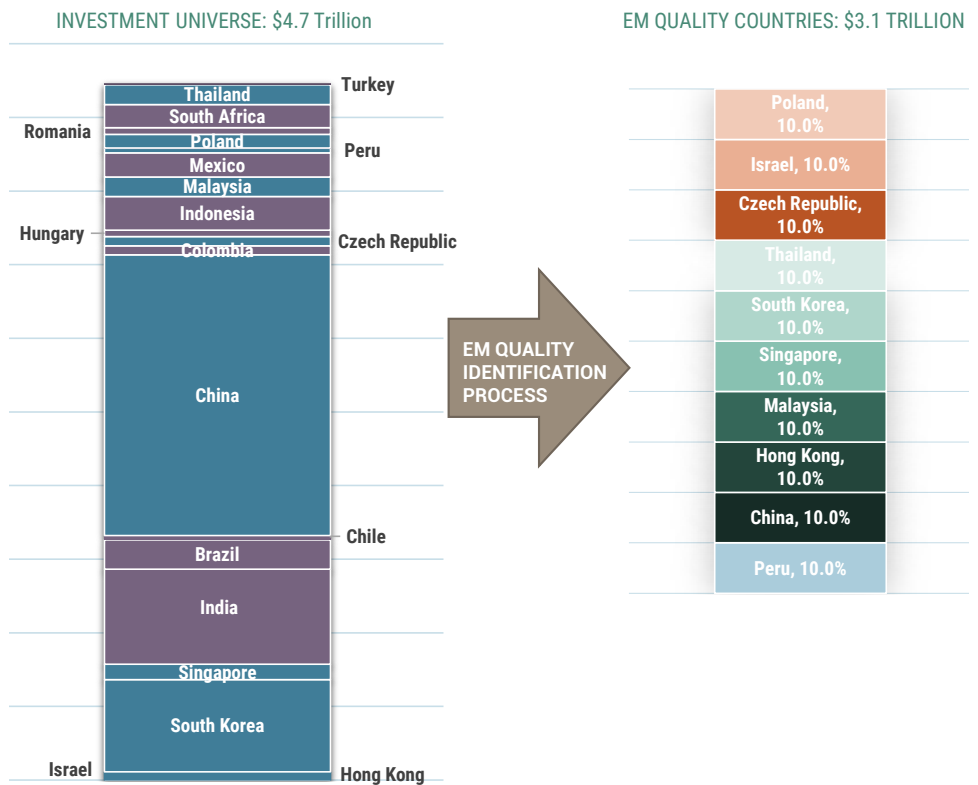
Period: June 2003 – December 2020 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

APPENDIX C

Defining the EM Quality Debt Investable Universe

Given the diversity of emerging markets, it is also important to quantify the overall investability of the emerging markets quality debt universe. We estimate that the broad emerging markets complex is approximately \$4.7 trillion at the end of March 2022, and through the quality identification process, we retain a universe of \$3.1 trillion, as shown below. While the reduction is substantial, it leaves a broad, well-represented part of the emerging markets universe accessible and tradeable without significant capacity constraints.



As of 3/31/2022 | Sources: GMO, J.P. Morgan

APPENDIX D

Attribution Results

	<i>EM Quality</i>			<i>DM* Adj</i>			<i>Relative Returns</i>		
	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>
2003	3.2%	-1.8%	5.2%	6.5%	-0.9%	7.5%	-3.3%	-0.9%	-2.4%
2004	13.0%	5.0%	7.7%	9.3%	4.1%	5.0%	3.7%	0.8%	2.7%
2005	1.1%	1.3%	-0.2%	-6.9%	4.2%	-10.6%	8.0%	-2.9%	10.4%
2006	13.8%	4.9%	8.5%	4.9%	2.2%	2.6%	9.0%	2.7%	5.9%
2007	11.2%	4.0%	6.9%	8.9%	3.9%	4.8%	2.3%	0.1%	2.1%
2008	2.5%	8.2%	-5.2%	8.9%	6.2%	2.6%	-6.4%	1.9%	-7.7%
2009	10.1%	2.5%	7.4%	3.3%	1.8%	1.5%	6.9%	0.7%	6.0%
2010	10.9%	3.4%	7.3%	5.3%	2.6%	2.6%	5.7%	0.8%	4.7%
2011	3.1%	4.6%	-1.4%	4.6%	3.5%	1.1%	-1.5%	1.1%	-2.6%
2012	13.6%	6.8%	6.4%	0.7%	4.0%	-3.2%	12.9%	2.8%	9.6%
2013	-4.6%	-3.0%	-1.6%	-3.8%	1.1%	-4.8%	-0.8%	-4.1%	3.2%
2014	0.3%	5.3%	-4.8%	-1.7%	7.0%	-8.2%	2.0%	-1.7%	3.4%
2015	-5.9%	0.5%	-6.4%	-3.3%	1.2%	-4.4%	-2.6%	-0.6%	-2.0%
2016	3.4%	2.7%	0.6%	1.4%	3.5%	-2.1%	2.0%	-0.8%	2.7%
2017	13.3%	3.6%	9.3%	6.7%	1.4%	5.1%	6.6%	2.1%	4.2%
2018	-1.4%	3.1%	-4.4%	-1.0%	2.4%	-3.3%	-0.5%	0.6%	-1.0%
2019	8.4%	7.7%	0.6%	3.5%	5.3%	-1.7%	4.9%	2.4%	2.3%
2020	7.5%	5.8%	1.6%	6.8%	2.9%	3.8%	0.7%	2.9%	-2.2%
2021	-7.6%	-4.4%	-3.3%	-6.3%	-1.3%	-5.1%	-1.2%	-3.1%	1.8%
2022	-8.2%	-4.8%	-3.5%	-14.2%	-7.9%	-6.9%	6.0%	3.0%	3.4%

	<i>EM Quality</i>			<i>DM* Adj</i>			<i>Relative Returns</i>		
	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>	<i>Total Return</i>	<i>Hedged</i>	<i>FX</i>
3yrs	-3.0%	-1.3%	-1.7%	-5.0%	-2.2%	-2.8%	2.0%	0.9%	1.1%
5yrs	-0.5%	1.3%	-1.8%	-2.5%	0.2%	-2.7%	2.0%	1.2%	0.9%
10yrs	0.3%	1.6%	-1.3%	-1.4%	1.5%	-2.8%	1.7%	0.1%	1.6%
15yrs	2.8%	2.7%	0.1%	0.5%	2.2%	-1.6%	2.2%	0.5%	1.7%
ITD	4.2%	2.8%	1.4%	1.5%	2.4%	-0.8%	2.7%	0.4%	2.3%

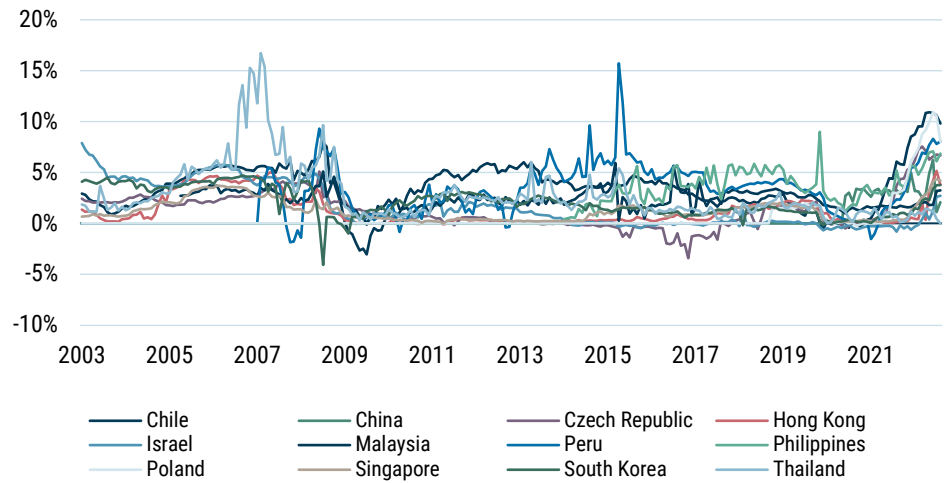
Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

APPENDIX E

Hedging Costs per Country

HEDGING COST



Period: June 2003 – December 2022 | Sources: GMO, J.P. Morgan

APPENDIX F

Correlation Results

MONTHLY RETURN CORRELATIONS (USD)

	EM Quality Hedged	GBI-EM GD Hedged	DM* Adj Hedged	EM Quality	GBI-EM GD	DM* Adj	GBI Global: United States 5 - 7 Years	MSCI EM	S&P 500	MSCI World ex USA
EM Quality Hedged	1.0									
GBI-EM GD Hedged	0.8	1.0								
DM* Adj Hedged	0.7	0.5	1.0							
EM Quality	0.7	0.8	0.3	1.0						
GBI-EM GD	0.5	0.8	0.2	0.9	1.0					
DM* Adj	0.6	0.5	0.5	0.8	0.6	1.0				
GBI Global: United States 5 - 7 Years	0.7	0.4	0.7	0.4	0.2	0.6	1.0			
MSCI EM	0.2	0.5	-0.1	0.7	0.8	0.4	-0.1	1.0		
S&P 500	0.2	0.4	0.0	0.5	0.6	0.2	-0.2	0.7	1.0	
MSCI World ex USA	0.2	0.5	-0.1	0.6	0.7	0.4	-0.1	0.9	0.9	1.0

Period June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.

3-YEAR ROLLING RETURN CORRELATIONS (USD)

	EM Quality Hedged	GBI-EM GD Hedged	DM* Adj Hedged	EM Quality	GBI-EM GD	DM* Adj	GBI Global: United States 5 - 7 Years	MSCI EM	S&P 500	MSCI World ex USA
EM Quality Hedged	1.0									
GBI-EM GD Hedged	0.8	1.0								
DM* Adj Hedged	0.8	0.6	1.0							
EM Quality	0.7	0.9	0.4	1.0						
GBI-EM GD	0.6	0.9	0.3	1.0	1.0					
DM* Adj	0.8	0.8	0.5	0.9	0.8	1.0				
GBI Global: United States 5 - 7 Years	0.8	0.7	0.6	0.7	0.6	0.8	1.0			
MSCI EM	0.1	0.5	0.0	0.6	0.7	0.3	0.0	1.0		
S&P 500	-0.4	-0.3	-0.3	-0.3	-0.3	-0.6	-0.6	0.2	1.0	
MSCI World ex USA	-0.2	0.2	-0.2	0.2	0.3	-0.2	-0.4	0.8	0.7	1.0

Period June 2003 – December 2022 | Sources: GMO, J.P. Morgan

Past performance, whether model or actual, is no guarantee of future results.