

KENFO Working Paper

Dealing with Reputational Risk in Emerging Markets Hard Currency Sovereign Bonds¹

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Abstract

Reputational risks are particularly pronounced for Western sovereign wealth funds when investing in emerging markets debt. Yet, entirely excluding this asset class has several drawbacks as the asset class is quite large in terms of market capitalization and has delivered high risk-adjusted returns in the past. In addition, sustainability considerations strongly speak in favor of investing in emerging markets sovereigns. Hence, we explore different ways to build custom benchmark indices which are designed to serve two purposes: On the one hand, these custom benchmarks should address reputational risks by excluding issuers based on objective criteria on reputational risks. On the other hand, these custom benchmarks are supposed to deliver risk and return profiles which are as similar as possible to the full universe of emerging markets sovereigns. In our historical simulations, we find that a “naïve” approach which simply weights the compliant issuers by market capitalization would have fared quite well. Even better results can be obtained by resorting to an alternative approach to constructing a custom benchmark, which is based on optimization techniques, and which ties certain risk metrics to the broad benchmark of the asset class. Episodes of sovereign debt default cannot be avoided with the help of our criteria for addressing reputational risks. Such episodes account for a large part of the tracking error of our custom benchmarks, but our optimization-based approach delivers an interesting asymmetry around such events mitigating underperformance from the default of sovereigns with low reputational risks and fully harvesting outperformance from the default of issuers with high reputational risks.

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1 Introduction

Over sufficiently long investment horizons, emerging markets sovereign bonds denominated in external (“hard”) currency offer excess returns over developed markets treasuries which are higher than those of corporate bonds and of a similar order of magnitude as the excess returns of equities (cf. Meyer, Reinhart, and Trebesch (2022)). Studies focusing on the JP Morgan Emerging Market Bond Index (EMBI) index family, a widely used emerging markets hard currency sovereign bonds benchmark, confirm the existence of high excess returns in the investable universe since the 1990s (cf. Broner, Lorenzoni, and Schmukler (2013), Andritzky and Schumacher (2019)). As a result, emerging markets hard currency sovereign bonds provide long-term investors such as KENFO with a source of returns and a means of portfolio diversification which is highly attractive.

Yet, this asset class entails at least two major sources of risk which are of high relevance to a sovereign wealth fund from a Western democracy. First, there is a serious degree of default risk in the emerging markets hard currency sovereign bonds market (cf. Panizza, Sturzenegger and Zettelmeyer (2009), Aguiar and Amador (2014)). This represents a financial risk which is compensated for by high coupons and attractive excess returns as recently shown, for instance, by Andritzky and Schumacher (2019) and Meyer, Reinhart, and Trebesch (2022). But second, there are serious reputational risks connected to some of the most prominent issuers in today’s emerging markets hard currency sovereign bond universe. As we discuss in depth in the present paper, valued by market capitalization of the outstanding bonds, a non-negligible fraction of issuers in the investment universe of emerging markets hard currency sovereign bonds has serious deficits regarding some of the most important cornerstones of the constitutions of Western democracies – namely human rights, civil liberties, democracy, and political participation.² In particular for sovereign wealth funds from Western democracies, this raises serious questions with respect to investing directly via sovereign bonds into political regimes which disregard or seriously violate those fundamental principles on which a Western democracy is built. In addition to issues of credibility with regard to being an advocate for human rights and democracy, this confronts sovereign wealth funds from Western democracies and their political stakeholders with serious reputational risks.

One way to deal with such credibility issues and reputational risks is to divest the asset class. For instance, with the Norwegian Government Pension Fund Global, one of the largest sovereign wealth funds from a Western democracy has made this choice.³ This way of dealing with reputational risks in the emerging markets hard

² Cf. Figure 2, for instance.

³ In the “Management Mandate for the Government Pension Fund Global” as of September 5, 2022, it says in Section 1-5. (4): “The Ministry shall adopt a plan for the phaseout from the strategic benchmark index of debt instruments issued by governments of, and companies domiciled in, countries classified as an emerging market.”

currency sovereign bond universe has some disadvantages, though: First and foremost, ignoring the asset class altogether forfeits the extraordinary return and diversification potential of this asset class for the fund portfolio, which is implied by the relatively high excess returns relative to both stocks and corporate bonds as documented in the aforementioned works by Andritzky and Schumacher (2019) and Meyer, Reinhart, and Trebesch (2022), among others. Second, the asset class accounts for a non-negligible fraction of global financial wealth. As Meyer, Reinhart, and Trebesch (2022) note, data collected by the Bank for International Settlements (BIS) implies that the stock of outstanding external sovereign bonds was roughly equal to the amount of outstanding German government debt or 10% of U.S. government debt in 2017. Hence, excluding this asset class implies a significant limitation of the investible universe for a sovereign wealth fund.

Third, there are several good reasons from a sustainability perspective to invest in emerging markets sovereign debt: Estimates by the Organization for Economic Cooperation and Development (OECD) suggest a global funding gap of 3.7 trillion US dollars to meet the United Nations sustainable development goals (UN SDGs) by 2030 (cf. OECD (2020)). Leading sustainability initiatives have pointed out that this funding gap can only be bridged if emerging markets are considered (cf. UN PRI (2022)). The UN-convened Net Zero Asset Owner Alliance (AOA) argues that the financial need is particularly acute in emerging markets, which have been responsible for fewer emissions in the past, but which are more vulnerable to climate change and have fewer resources to transition from their dependence on fossil fuels (cf. United Nations Environment Programme (2023)).⁴ An exclusion of the asset class of emerging markets sovereign debt may thus contradict efforts for a global *just transition*.⁵ In addition, developing country governments are likely to struggle to raise finance as sovereign borrowing capacity has been reduced by the economic impacts of COVID-19 (cf. OECD (2021)). Overall, the AOA concludes that private and public investments in emerging markets are needed in order to meet the targets of the Paris Agreement and to close the existing funding gap to achieve sustainability goals (cf. United Nations Environment Programme (2023)). Sustainability-linked, social, and green bonds within the hard currency sovereign bond universe can also play a crucial role for this as these bonds may help governments to raise financial funds for various purposes which are crucial for meeting net-zero targets, such as clean energy and technology or sustainable agriculture and the supporting infrastructure (cf. Banga (2019)). Thus, bonds placed by the public

⁴ KENFO joined the AOA as the first sovereign wealth fund in March 2020.

⁵ The *just transition principle* describes the approach that climate action “must be attuned to the needs of and involve the most vulnerable groups of society” (cf. United Nations Development Programme (2016)). Just transition was considered in the Paris Agreement in 2015. The concept of just transition addresses the social risks and impacts on workers, suppliers, communities, and consumers, as well as climate justice issues which emerge within and between countries and regions.

sector and governments may help to address energy and food security concerns in emerging markets (cf. Amundi (2022)).⁶

Both financial considerations related to risk and return metrics of a sovereign wealth fund as well as considerations related to global sustainable development goals thus suggest that it is more advantageous to find a way to keep investing into emerging markets hard currency sovereign bonds which avoids reputational risks and credibility issues. A natural approach would consist in dividing the universe into issuers, which are acceptable in light of the principles of human rights, civil liberties, democracy, and political participation, and issuers, which are not acceptable on these grounds, and to define the investable universe for a Western sovereign wealth fund as consisting only of those issuers which comply with these basic principles. While this approach is intuitive, it is far from being straightforward to implement in practice. Measures of compliance of sovereign debt issuers with fundamental principles of Western democracies such as human rights, civil liberties, democracy, and political participation are publicly available, such as the Democracy Index from Economist Intelligence Unit (cf. Economist Intelligence Unit (2021)) or the Global Freedom Scores and Democracy Scores from Freedom House (cf. Freedom House (2022)). However, using these data to assess which parts of the emerging markets hard currency sovereign bonds space may be acceptable for a Western sovereign wealth fund, it turns out that such an approach sorts out a quite large fraction of that universe when weighted by market capitalization.

Figure 1 illustrates this issue. Like a cumulative distribution function, Figure 1 plots the fraction of issuers in the Bloomberg Emerging Markets Sovereign TR Index weighted by market capitalization which exhibit an Economist Intelligence Unit (EIU henceforth) democracy score which is smaller or equal to what is shown on the horizontal axis, respectively.⁷ The Bloomberg Emerging Markets Sovereign TR Index represents a broad market capitalization weighted benchmark index for the universe of emerging markets bonds denominated in US dollar, which is by far the largest fraction of emerging markets sovereign debt in hard currency. In addition to assigning each country a score on a scale from 0 to 10 with 10 being the best possible value, EIU also classifies countries into one of the following four categories: Countries with a score between 8 and 10 are classified as “full democracies”, from 6 to 8 as “flawed democracies”, from 4 to 6 as “hybrid regimes” and from 0 to 4 as “authoritarian regimes”.

⁶ Recent examples include green bonds by the government of the Philippines to retire its coal-fired power plants and seek more investments in renewable energy or Benin’s issuance of sustainability-linked bonds to achieve Benin’s committed SDGs (cf. World Bank (2022)).

⁷ Cf. Economist Intelligence Unit (2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023). © 2013 The Economist Intelligence Unit Ltd. All rights reserved. Whilst efforts have been taken to verify the accuracy of this information, neither The Economist Intelligence Unit Ltd. nor its affiliates can accept any responsibility or liability for reliance by any person on this information.

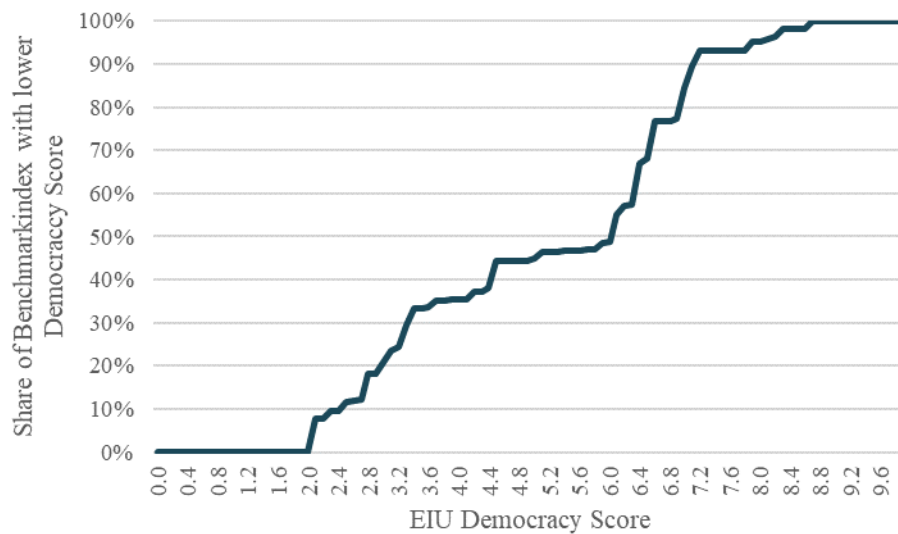


Figure 1: Share of the Bloomberg Emerging Markets Sovereign TR Index which would be excluded based on a threshold for the EIU democracy score using benchmark weights as of December 30, 2022, and EIU democracy index 2020; sources: Bloomberg, EIU, own calculations

As Figure 1 indicates, ruling out those countries which are classified as “authoritarian regimes” according to EIU’s democracy score from 2020 would narrow down the investible universe by about one third of the Bloomberg Emerging Markets Sovereign TR Index as of December 30, 2022.⁸ Figure 2 shows that a very similar picture emerges if we consider earlier vintages of EIU democracy scores along with year-end benchmark weights of the Bloomberg Emerging Markets Sovereign TR Index. If one chooses to draw the line between issuers which are eligible for a sovereign wealth fund from a Western democracy under considerations of reputation and credibility at an EIU democracy score of 4.0, the investible universe is narrowed down by about 20 to 40%.

⁸ EIU publishes its democracy indices for a given year not before some point into the subsequent year. In the quantitative exercises below, we thus lag EIU democracy scores by two years to make sure that they were available throughout the entire year in which we use them for our simulation exercises. To be consistent, we apply the same logic to Figure 1 and Figure 2.

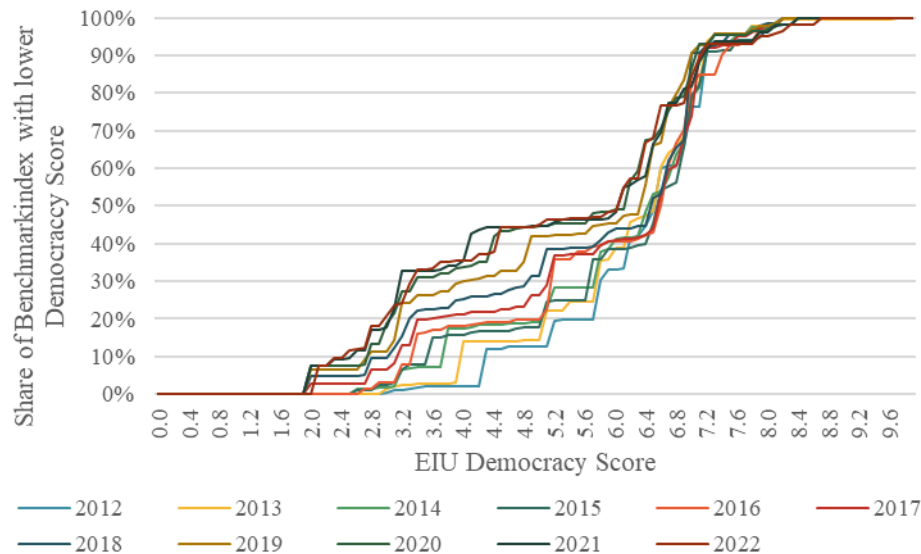


Figure 2: Share of the Bloomberg Emerging Markets Sovereign TR Index which would be excluded based on a threshold for the EIU democracy score with benchmark weights as of year-end of preceding year and EIU democracy index lagged by two years; sources: Bloomberg, EIU, own calculations

The fact that substantial fractions of the emerging markets hard currency sovereign bonds space are not consistent with basic requirements regarding human rights, civil liberties, democracy, and political participation raises important issues regarding the practical implementation of any approach which aims at investing the asset class but avoiding issuers which are not compliant with those basic requirements. First, mandated asset managers require benchmarks against which they manage their mandates. That aspect can, in principle, be addressed with the help of custom benchmarks which exclude issuers from the universe which do not satisfy certain requirements, such as an EIU democracy score of at least 4.0, for example. However, a second aspect which needs to be addressed, too, is the weighting of the remaining issuers in such a custom benchmark index. Depending on how the democracy characteristics of issuers are correlated with financial metrics which determine the risk and return profile of a benchmark index, such as spreads or duration, and depending on which weighting method is chosen in the construction of a custom benchmark index, such a customized benchmark index for a reduced universe which avoids reputational risks might exhibit quite different risk and return characteristics. This poses an additional challenge for asset allocators whose task is to construct portfolios based on the (expected) risk and return characteristics of asset classes. Asset allocators thus need to understand very carefully the risk and return properties of a reduced investment universe and the weighting scheme behind a custom benchmark index.

Thus, in the present paper, we study the risk and return profile of custom benchmark indices which emerge from different weighting methods and different exclusion thresholds for scores which aim at assessing an issuer's

compliance with values which determine a Western sovereign wealth funds credibility issues and reputational risks regarding human rights, civil liberties, democracy, and political participation. In our historical simulations, we find that a “naïve” approach which simply weights the compliant issuers by market capitalization would have fared quite well in delivering a risk and return profile that comes close to what the broad benchmark for the asset class exhibits. That convenient outcome could, however, be pure coincidence. Hence, we also study an alternative approach to constructing a custom benchmark, which is based on optimization techniques, and which ties certain risk metrics to the broad benchmark of the asset class to deliver a systematically undistorted risk and return profile. This approach turns out to deliver even better results, albeit at the cost of higher turnover in the benchmark. Episodes of sovereign debt default account for a large part of tracking error of our custom benchmarks, but our optimization-based approach delivers an interesting asymmetry around such events mitigating underperformance from defaulting sovereigns with low reputational risks and fully harvesting outperformance from debt defaults by sovereigns with high reputational risks.

Our paper is organized as follows: Section 2 describes the bond market data and data on reputational risks we use for our analysis. In section 3, we explore the “naïve” weighting scheme which simply scales up the benchmark weights of the remaining issuers after applying our exclusion criteria to deal with reputational risks. Section 4 then turns to an optimization-based alternative approach which seeks more systematic control over the risk and return profile of the custom benchmark than our “naïve” approach. Even though the major focus of the present paper is on reputational risks, in section 5 we briefly analyze how our custom benchmarks would have fared in periods with sovereign default events in our sample documenting what can and what cannot be expected from the custom benchmarks we study. Section 6 offers some concluding remarks.

2 Description of the Data

As a measure for a country’s reputational risk for a Western sovereign wealth fund we use the EIU democracy index which has been published since 2006 and which is available on an annual basis since 2010. EIU rates countries in five sub-categories: electoral process and pluralism, functioning of government, political participation, political culture, and civil liberties. Each sub-category is ranked on a scale from 0 to 10 with 10 being the best possible score. The overall democracy score for a given country is the mean of the five scores on the sub-categories. The first and the fifth sub-category are arguably the most relevant to a Western sovereign wealth fund which is concerned with credibility issues and reputational risk. That is not to say that the remaining sub-categories are not interesting for the purpose of addressing reputational risks, though. For instance, the sub-category on the

functioning of government accounts in various ways for corruption in a country. Therefore, we choose to work with the overall democracy score which includes all five sub-categories throughout our work. A widely published and easily accessible measure of the reputational risks of a country seems to be very useful for a sovereign wealth fund which needs to communicate its investment policy to its political stakeholders and to the general public.

In the quantitative exercises throughout this paper, we generally use EIU democracy scores which are lagged by two years. For instance, for benchmark construction for the year 2022, we use the EIU democracy scores from the 2020 report. As figures for a given year are reported at some point during the subsequent year – for example, 2020 scores are not reported until well into the year 2021 – this procedure makes sure that the scores we use in the historical simulations were known throughout the entire year for which we use them for benchmark construction purposes. The EIU democracy scores are highly correlated with similar scores by alternative research institutions such as Freedom House or Maplecroft, so our results are largely robust to the choice of data source.

The emerging markets hard currency sovereign bonds universe we use for our quantitative exercises is the Bloomberg Emerging Markets Sovereign TR Index along with its country-specific sub-indices. The Bloomberg Emerging Markets Sovereign TR Index is a broad index of emerging markets sovereign debt which is denominated in US dollars. In addition to daily time series on metrics such as total return, yield to worst (YTD henceforth), option adjusted spreads over treasuries (OAS henceforth), and option adjusted duration over treasuries (OAD henceforth) at the index level representing the entire asset class, we also collect these data for the country-specific sub-indices for 70 sovereign issuers which were members of the parent index at some point over our sample period from December 31, 2011 until December 30, 2022.⁹ In addition, we collect the weights of the various issuers in the Bloomberg Emerging Markets Sovereign TR Index at year-ends over our sample period. The country-specific time series vary widely regarding their respective length. As a compromise between a nearly full coverage of the asset class in terms of issuers and a sufficiently long history for our simulation exercises, we choose to use the period from December 31, 2017, until January 2, 2023, for our quantitative exercises.¹⁰ Hence, our sample covers

⁹ The 70 issuers in our sample include: Angola, Argentina, Armenia, Azerbaijan, Bahrain, Belarus, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Georgia, Ghana, Guatemala, Honduras, Hungary, Iceland, India, Indonesia, Iraq, Israel, Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Latvia, Lebanon, Lithuania, Malaysia, Mexico, Mongolia, Morocco, Mozambique, Namibia, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Saudi Arabia, Senegal, Serbia, South Africa, South Korea, Sri Lanka, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Arab Emirates, Uruguay, Venezuela, Vietnam, Zambia. For India, Russia, and South Africa, we could not find a country-specific sub-index, so for these three issuers we use a different country-specific Bloomberg benchmark index of US dollar denominated debt which also includes corporate issuers. In addition, we dropped some very small issuers from the sample for which we were not able to collect the required data on bonds markets or democracy scores or where time series are too short for our purposes. These are Belize, Bermuda, Bulgaria, Cameroon, Papua New Guinea, Rwanda, Suriname, Tajikistan, The Bahamas, and Uzbekistan.

¹⁰ In our quantitative exercises, we choose the first trading date of any given year for rebalancing, so we add the first trading date of 2023 as an additional allocation date to compute clean performance and turnover statistics for five full years.

five full years of data at a daily frequency. At year-end, the country-specific sub-indices for the 70 sovereign issuers in our sample account for more than 99 percent of market capitalization of the parent index over the entire sample period.

Figure 3, Figure 4, and Figure 5 provide a snapshot of the data with the index weights and characteristics of the country-specific sub-indices as of December 30, 2022 and the EIU democracy scores from the 2020 report. Even though these descriptive figures only indicate how risk and return properties in the benchmark index correlate with EIU democracy scores and market capitalization at a specific point in time, they illustrate the basic issues asset allocators have to deal with when ruling out a part of the universe based on democracy scores. Figure 3 plots YTW against EIU democracy scores. As there are some issuers with very high yields in the universe, Figure 4 provides an alternative view on the return potential of the various issuers by focusing on the OAS of only those issuers with an OAS of less than 10% as of year-end 2022. As Figure 3 and Figure 4 indicate, cutting off authoritarian regimes with an EIU democracy score of less than 4.0 means that some very prominent issuers in the benchmark index with lower spreads get ruled out. However, due to the presence of some issuers with high spreads and low democracy scores, the simple correlation between yields and spreads on the one hand and democracy scores on the other hand is slightly negative both in the full sample and the reduced sample as indicated by the linear regression lines displayed in Figure 3 and Figure 4. Weighted by market cap, that correlation turns out to be close to zero, though. Figure 5 repeats the same exercise for OAD for the full sample. Here, the correlation is positive due to the presence of many issuers with good democracy scores and high OAD. Weighted by market cap, though, this correlation becomes virtually zero as in the case of OAS and YTW.



Figure 3: EIU Democracy Scores 2020 and YTW of the country-specific sub-indices as of December 30, 2022, with linear regression line; size of the bubbles indicates benchmark weights of the issuers in the Bloomberg Emerging Markets Sovereign TR Index as of December 30, 2022; sources: Bloomberg, EIU, own calculations

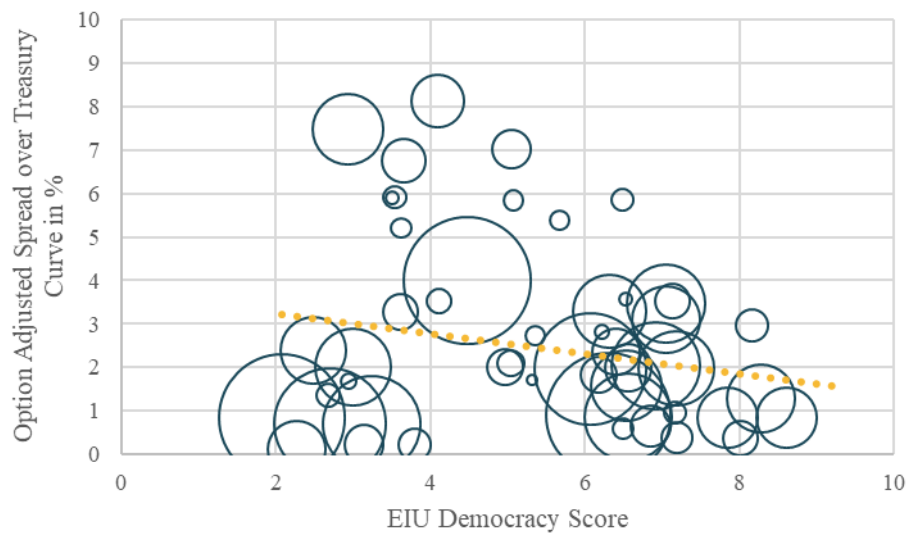


Figure 4: EIU Democracy Scores 2020 and OAS of the country-specific sub-indices as of December 30, 2022, with linear regression line; size of the bubbles indicates benchmark weights of the issuers in the Bloomberg Emerging Markets Sovereign TR Index as of December 30, 2022; sub-sample where OAS is less than 10%; sources: Bloomberg, EIU, own calculations

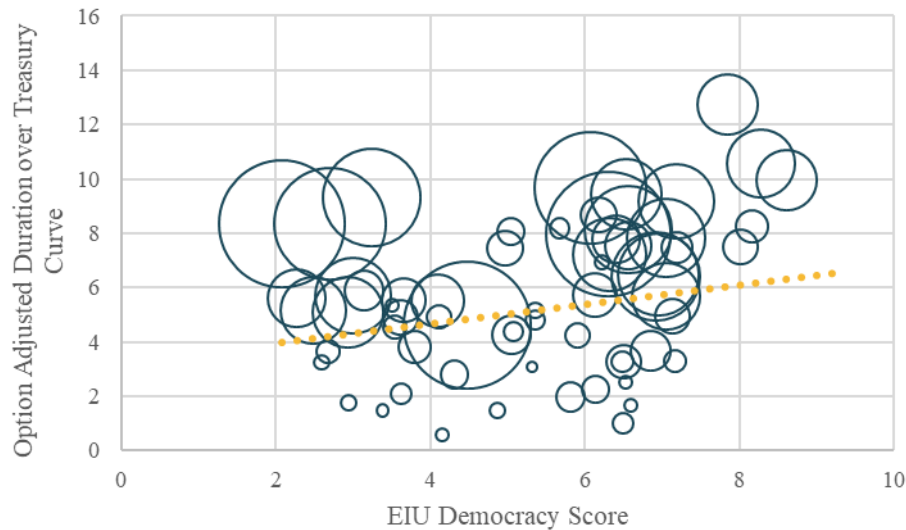


Figure 5: EIU Democracy Scores 2020 and OAD of the country-specific sub-indices as of December 30, 2022, with linear regression line; size of the bubbles indicates benchmark weights of the issuers in the Bloomberg Emerging Markets Sovereign TR Index as of December 30, 2022; sources: Bloomberg, EIU, own calculations

3 “Naïve” Custom Benchmarks

3.1 Methodological Approach

Provided that similar pictures as in Figure 3, Figure 4, and Figure 5 emerge over the entire sample period, “naïve” custom benchmarks, which simply weight securities with sufficiently high democracy scores by their market capitalization, might go a long way in delivering a virtually undistorted risk return profile for the asset class, while getting rid of reputational risks. Thus, as a first weighting scheme for custom benchmarks, we explore the risk and return profile of the asset class which results from ruling out all issuers below a certain threshold for the EIU democracy score and weighting the remaining issuers by their market capitalization, i.e. scaling up their portfolio weights in the Bloomberg Emerging Markets Sovereign TR Index in a proportional manner. The first allocation date in our historical simulations is the first trading day in 2018 and we work under the assumption of annual rebalancing, so that index weights are adjusted on the first trading day of each calendar year based on the issuers’ weights in the Bloomberg Emerging Markets Sovereign TR Index at the last trading day of the respective preceding year. For simplicity, we ignore trading costs throughout this paper, but we do compute and report the portfolio turnover associated with any given custom benchmark strategy we simulate.

Throughout any given year, we do not rebalance the benchmarks. This means that benchmark weights evolve according to the relative performance of the various country-specific sub-indices. As a consequence, we are

missing potential changes in the index with bonds being added to or dropped from the index throughout the year. This does by itself imply some tracking error with respect to the broad benchmark index even if we did not exclude any issuers based on democracy scores or other criteria. In order to disentangle to which extent differences between the actual benchmark index and our custom indices are just caused by these construction issues, we use a second benchmark index for assessing our results. That additional benchmark index is constructed using the full set of country-specific sub-indices without any exclusions and following the same index construction methodology where we allocate on the first trading day of each year based on the portfolio weights in the Bloomberg Emerging Markets Sovereign TR Index on the last trading day of the preceding year and without any rebalancing throughout the year. Any differences between the actual benchmark index and that custom benchmark with the full investment universe are due to data limitations or index construction issues and do not reflect implications of ruling out issuers based on democracy scores. To draw out those implications, we thus mainly compare our custom benchmark indices with exclusions based on the EIU democracy scores to the custom benchmarks we obtain from applying a similar index construction methodology to the full universe of country-specific sub-indices of the Bloomberg Emerging Markets Sovereign TR Index.

3.2 Return Profile

As EIU suggests a democracy score of 4.0 to draw the line between “authoritarian regimes”, which pose particular reputational risks to Western sovereign wealth funds, and regimes, which are at least “hybrid regimes”, we first explore our “naïve” index construction strategy with a threshold of 4.0 for the EIU democracy score to sort out issuers with high reputational risks.¹¹ Figure 6 plots the monthly returns from the simulation of our custom benchmark index based on the full sample of country-specific sub-indices against the monthly returns of the Bloomberg Emerging Markets TR Sovereign Index. As Figure 6 illustrates, the correlation of monthly returns in our sample is nearly perfect with a value of 99.9%. This suggests that our custom benchmark construction methodology which allocates only once a year and uses country-specific sub-indices does very well in matching the performance of the broad benchmark index for the asset class. Nonetheless, the tracking error of that custom benchmark based on the full sample of issuers with respect to the benchmark index as calculated from the daily time series of our simulations amounts to 0.52% p.a., so the fit is not exactly perfect. Our custom benchmark

¹¹ We address the robustness of our results to different choices of that threshold in section 3.5.

construction methodology thus does generate some small discrepancies even before bringing exclusions which address reputational risks into the picture.

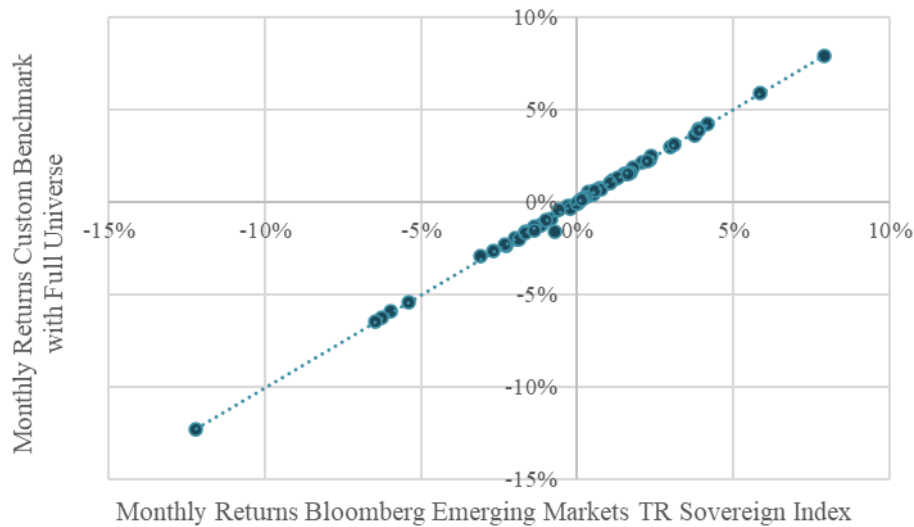


Figure 6: Monthly returns in simulated time series with “naïve” weighting method for a custom benchmark index based on the full universe versus Bloomberg Emerging Markets TR Sovereign Index; sources: Bloomberg, own calculations

Figure 7 plots the monthly returns from the simulation of our custom benchmark index based on the sub-sample with democracy scores of at least 4.0 at the respective allocation dates against the Bloomberg Emerging Markets TR Sovereign Index. As in the case of the full universe, we obtain a quite high correlation of monthly returns of 98.5%. The tracking error with respect to the benchmark index is 1.73% p.a. As pointed out in the comparison of the custom benchmark index derived from the full investible universe with the Bloomberg benchmark, 0.52 percentage points of this are due to issues related to data quality, rebalancing frequency, etc. So, we find that with a threshold for the EIU democracy score of 4.0, the historical simulation suggests that the exclusions we use to address reputational risks account for about 1.21% p.a. of tracking error with an additional 0.52% p.a. coming on top due to practical issues related to using a custom benchmark index. Thus, as far as replicating the return profile of the asset class benchmark for emerging markets hard currency debt is concerned, our “naïve” portfolio construction method which simply scales up the benchmark weights of the remaining issuers fares quite well. This comes with an acceptable amount of portfolio turnover of 6.1% p.a. for the custom benchmark strategy with the full universe and only 5.6% p.a. when attention is restricted to those issuers with an EIU score of at least 4.0.

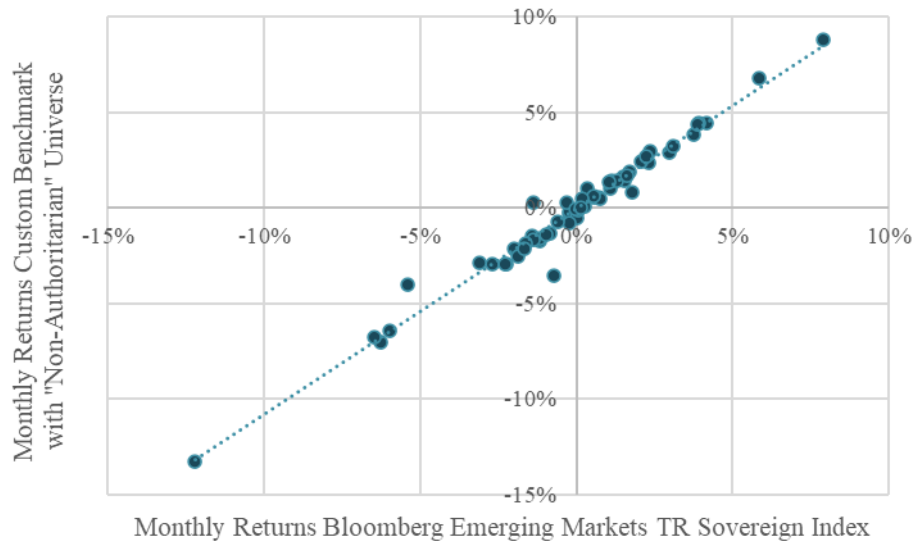


Figure 7: Monthly returns in simulated time series with “naïve” weighting method for a custom benchmark index based on universe with EIU democracy score of at least 4.0 versus Bloomberg Emerging Markets TR Sovereign Index; sources: Bloomberg, EIU, own calculations

3.3 Risk Profile

Based on the daily time series, we observe a beta of our custom benchmark index with respect to the Bloomberg Emerging Markets TR Sovereign Index of 1.08. In the monthly time series, this is reflected in a regression line with a slope greater than 1 as displayed in Figure 7. In addition, annualized volatility increases by around 10% as we move from the Bloomberg benchmark or the custom benchmark with the full universe to our custom benchmark index which rules out countries with EIU democracy scores below 4.0. Even though that increase in volatility may to a large extent be accounted for by the mechanical fact that we have less issuers in our universe so that idiosyncratic risks are less well diversified, we cannot rule out that there are additional systematic sources of higher financial risk in our custom benchmark as we restrict the universe to deal with reputational risks. The higher beta in the daily and monthly return time series points into a similar direction.

Working with the country-specific sub-indices allows us to look deeper into the risk profile of our custom benchmark index and to assess what might potentially be driving higher financial risks in our custom benchmark with the reduced universe. Looking at yields and spreads, we find that the median of the difference in the daily time series between our custom benchmark index with the reduced universe and the custom benchmark index with the full universe amounts to 57 and 54 basis points for YTW and OAS, respectively. The corresponding means are slightly lower with 53 and 50 basis points for YTW and OAS, respectively. Looking at the median of the difference in the daily time series between our custom benchmark index with the reduced universe and the custom benchmark

index with the full universe for OAD, we find a much smaller value of 6 basis points. The corresponding mean in the daily time series is 8 basis points. These numbers turn out to be very similar or even identical if we use the Bloomberg Emerging Markets TR Sovereign Index rather than the custom benchmark with the full universe for comparing YTW, OAS, and OAD. Hence, our index construction methodology does not affect these risk and return metrics per se, so any differences must be attributed to the exclusions from the investible universe.

As a result, we find that restricting our investible universe to issuers which do not entail too severe reputational risks for Western sovereign wealth funds and using this “naïve” scaling procedure to build a custom benchmark index hardly changes duration risk, but we do find somewhat higher yields and spreads reflecting higher credit risk in the reduced investment universe. Given that the median OAS in the daily time series over our sample period is 352 basis points for the Bloomberg Emerging Markets TR Sovereign Index, an increase by 54 basis points represents a non-negligible higher compensation for default risk as perceived by the market. Hence, it is in fact the case that financial risks turn out to be somewhat higher in our custom benchmark index if we restrict the investible universe to issuers with EIU democracy scores of at least 4.0. Our “naïve” index construction approach, which simply scales up the weights of the remaining issuers in the benchmark index according to the market value of the outstanding bonds, is not able to address such issues in a systematical way. In particular, that “naïve” index construction methodology makes any such differences in risk and return metrics a random product of the evolution of the bonds available in the investible universe as well as the EIU democracy scores. As a result, these differences are far from being constant over time as Figure 8 illustrates. This leaves asset allocators with a moving target relative to the benchmark index for the asset class, so to speak. For this reason, we consider an alternative index construction methodology further below in this paper, where we seek to control credit and duration risk by tying it to the asset class benchmark (cf. section 4).



Figure 8: Daily differences in YTW, OAD, and OAS between simulated return time series for “naïve” custom benchmark with reduced universe based on EIU democracy score versus “naïve” custom benchmark with full universe; sources: Bloomberg, EIU, own calculations

Yet another source of risk of deviating from the broad benchmark for the asset class pertains to idiosyncratic risk associated with the various issuers in the investible universe. By construction, narrowing down the universe by ruling out countries with too low EIU democracy scores will lead to an increase in the average benchmark weight (or “position size”) for the remaining issuers. Hence, on average, any idiosyncratic credit risks in the portfolio are necessarily assigned a higher weight. Figure 9 shows the dynamic evolution of the maximum position size in the custom benchmarks which obtain under our “naïve” index construction methodology for the entire universe of country-specific sub-indices and for the universe composed of only those country-specific sub-indices with an EIU democracy score of at least 4.0, respectively. As we rule out about one third of the investible universe with that choice of threshold over the entire sample period (cf. Figure 2), it is not surprising that the size of the largest position in the portfolio gets scaled up by a factor of around 1.5 from a median of 7.8% to a median of 11.5% over the entire sample period. This means that idiosyncratic risks associated with the issuers in the portfolio with the highest weights will matter substantially more for the risk profile of our custom benchmark index with lower reputational risk.

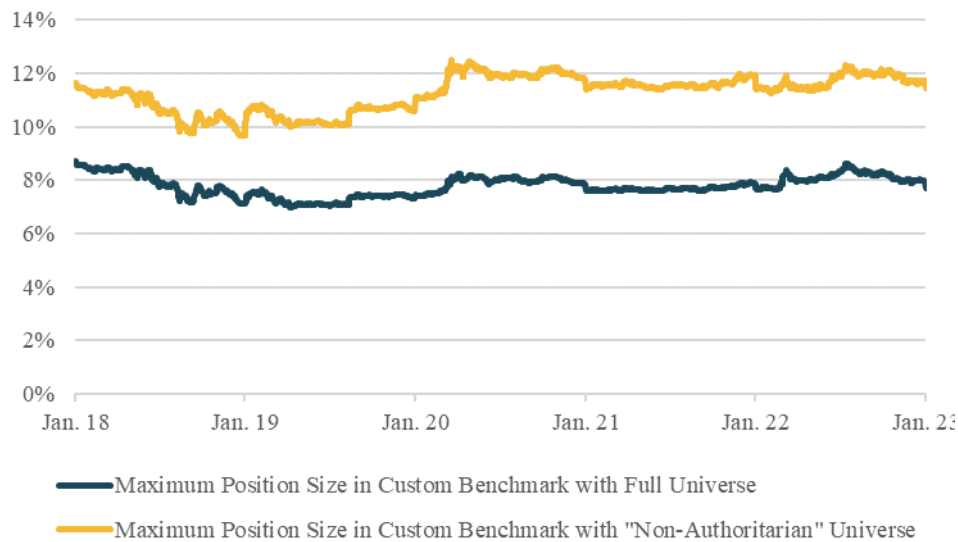


Figure 9: Dynamic evolution of maximum position size as percentage weight in “naïve” custom benchmark for the entire universe and for the “Non Authoritarian” universe with EIU democracy score of at least 4.0; sources: Bloomberg, EIU, own calculations

3.4 Caps on Benchmark Weights

As the weights of some issuers may become quite large with a median of the maximum position size of 11.5% over the entire sample period for the “naïve” custom benchmark methodology with a cutoff for the EIU democracy score of 4.0, one may ask whether caps on maximum position size in the benchmark construction process may help to limit idiosyncratic risks associated with single issuers without implying a too strong increase in tracking error. To explore that question, we build a version of the custom benchmark index strategy with a threshold for the EIU democracy score of 4.0 where we scale up portfolio weights proportionally, but only up to a maximum weight which is determined such that at each allocation date, the maximum weight for any issuer in the custom benchmark may not be higher than the maximum weight in the benchmark with the full universe of country-specific sub-indices. This results in a median of the maximum position size over the sample period of 8.0% for the custom benchmark with a threshold for the EIU democracy score of 4.0 in comparison to 7.7% for the custom benchmark index methodology applied to the entire universe of country-specific sub-indices.¹² This is a significant reduction in the median of the largest position size over the sample period, which, as discussed above, is 11.7% for the custom benchmark with a threshold for the EIU democracy score of 4.0 and no cap.

¹² We only require the two benchmarks to exhibit the same maximum weights at the beginning of each year and let weights float freely according to changes in market pricing for the bonds in our benchmark throughout each year. This results in deviations in maximum benchmark weights throughout the year and hence in the median of the maximum benchmark weight over the entire sample period.

Yet, the tracking error for this “capped” version of the custom benchmark is only 1.68% p.a. and the beta with respect to the Bloomberg Emerging Markets TR Sovereign Index is 1.08. The tracking error is thus actually somewhat lower than in the corresponding custom benchmark without the cap, while the beta takes on the same value which we also obtain without the cap. Turnover is only slightly higher with 6.2% p.a. The median in the difference of OAD relative to the custom benchmark index methodology applied to the full universe remains the same with 6 basis points. The only significant difference with regard to risk and return metrics induced by this cap shows up in the sample medians of the differences of OAS and YTW between the version of the custom benchmark with an EIU score of 4.0 on the one hand and the version with the entire universe of country-specific sub-indices on the other hand: With the cap, we obtain values for the median of these differences of 69 and 72 basis points for OAS and YTW, respectively, while we found only 54 and 57 basis points without the cap. Hence, if one is willing to accept slightly higher overall credit risk for the asset class, this historical simulation suggests that one can effectively limit idiosyncratic issuer risks by means of augmenting the “naïve” benchmark construction methodology by a cap which restricts the biggest weights in the benchmark not to exceed those of the parent index as approximated by the custom benchmark with the full universe of country-specific sub-indices.

3.5 Choice of Threshold for the EIU Democracy Score

Our choice of a threshold of 4.0 for the EIU democracy score thus far has been guided by the classification scheme explored by EIU where a value of 4.0 represents the watershed between countries which are labeled “authoritarian regimes” and “hybrid regimes”, respectively. This may be a useful threshold for the purpose of addressing reputational risks and credibility issues Western sovereign wealth funds are subject to. However, regarding the risk and return profile of the asset class, different choices for the threshold might lead to different outcomes. Therefore, we now ask the question what happens to the risk and return profile of our “naïve” custom benchmark in our historical simulations as we vary the threshold for the EIU democracy score cutting off issuers anywhere between 0.0 and 8.0.¹³

As the cutoff for the EIU democracy score increases, the medium of maximum position size in the custom benchmark goes up by the mechanics of our index construction method as long as we do not impose a cap, so idiosyncratic risks associated with the largest issuers in the benchmark clearly move with the choice of threshold.

¹³ We do not consider values of the EIU democracy score beyond 8.0 as this is the threshold to be a “full democracy” according to EIU methodology. In particular, a threshold of 8.0 would already rule out U.S. treasuries over large parts of our sample period, i.e. the treasury curve over which US dollar denominated emerging markets debt is priced.

A similar picture emerges regarding tracking error. Figure 10 shows how the annualized tracking error with respect to the asset class benchmark, the Bloomberg Emerging Markets TR Sovereign Index, changes in our historical sample as we move around the threshold for the EIU democracy score to manage reputational risks in the asset class.

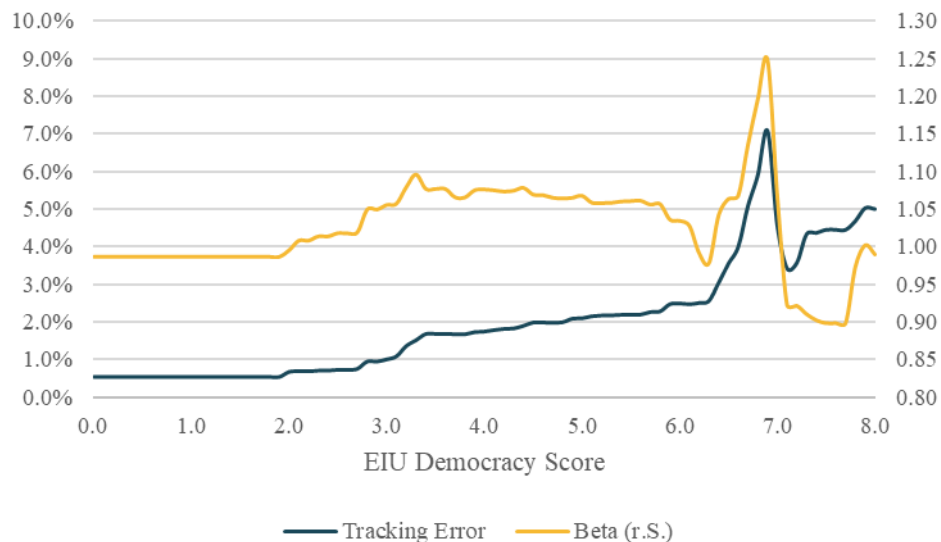


Figure 10: Tracking error and beta with respect to the Bloomberg Emerging Markets TR Sovereign Index associated with the “naïve” index construction method depending on choice of threshold for EIU democracy score; sources: Bloomberg, EIU, own calculations

As pointed out above, there is a floor of 0.52% of annualized tracking error which we obtain due to our index construction methodology even with the full universe of country-specific sub-indices as we do not account for changes in the composition of the parent index within any given year, as our universe neglects some of the smallest issuers in the parent index, and as we need to use sub-indices which also include corporates for India, Russia, and South Africa. Tracking error increases quite substantially in the historical simulations as the threshold for the EIU democracy score is raised beyond a level of 3.0. As Figure 10 shows, the range between 2.0 and 4.0 is also the region for the democracy score cutoff where the beta of our custom benchmark with respect to the Bloomberg Emerging Markets TR Sovereign Index increases quite a bit above the level of 1.00. The tracking error continues to increase quite steadily between values of 3.0 and 6.0 for the threshold for the EIU democracy score. Once passing a value of 6.0, which is the watershed between “hybrid regimes” and “flawed democracies” according to EIU, the tracking error increases rapidly to much higher values. The beta to the broad benchmark for the asset

class, by contrast, remains at elevated levels for any choice of the cutoff between 3.0 and 6.0 and moves around quite dramatically beyond a value of 6.0.

Compared to the choice of 4.0, the historical simulations thus suggest that the costs in terms of tracking error and beta associated with further raising the threshold for the EIU democracy score may be manageable in a range up to at least 5.0. The median of the weight of the largest issuer in the custom benchmark over our sample period will reach values as high as 13.4% if one raises the threshold up to 5.0, though. On the other hand, in the historical sample, there would have been serious gains in terms of a beta closer to 1.0 and a lower tracking error if the threshold for the EIU democracy score was chosen closer to 3.0 or even lower.

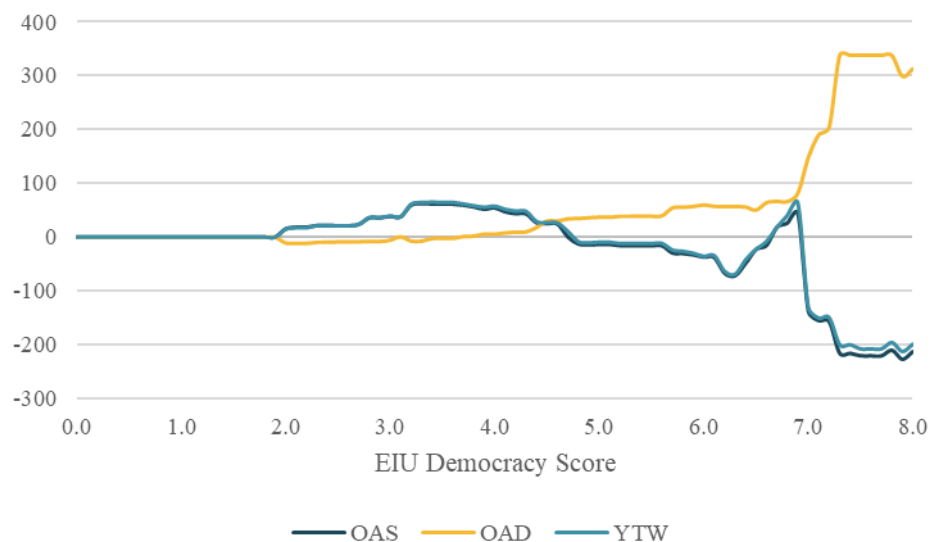


Figure 11: Sample medians of differences in OAS, OAD, and YTW between “naïve” custom benchmark for the universe with EIU democracy score of at least 4.0 and custom benchmark for the entire universe; sources: Bloomberg, EIU, own calculations

Looking at the medians of the differences over the sample period between OAS, OAD, and YTW for the custom benchmark with an EIU democracy score of at least 4.0 and the custom benchmark for all issuers (cf. Figure 11), one observes that OAS and YTW remain elevated by more than 50 basis points within a wide of values below the threshold of 4.0. So, historically, there was not much sensitivity around that threshold regarding credit spreads and yields if one contemplates becoming more relaxed about reputational risks. The premia in OAS and YTW do vanish to a large extent in the historical simulations, however, if one picks values for the EIU democracy score threshold between 4.2 and 5.0. Regarding OAD, one observes an upward trend around the threshold of 4.0, with the duration premium turning positive around that value and quickly rising to more significant levels for higher

thresholds for the EIU democracy score. Hence, at least as far as our sample period is concerned, there would not have been much to gain from moving around that threshold with regard to duration risk, either.

As a result, at least over the sample period we study in this paper, there would have been some scope for varying the threshold around the level of 4.0 without significant differences in yields, tracking error, beta, credit risk, and duration risk in the custom benchmark. However, as moving to higher threshold values implies additional limitations for the investible universe and as lowering that threshold moves into the territory of “authoritarian regimes” with stronger reputational risks and credibility issues, the historical simulations do not make a strong case for a different choice for the threshold for the EIU democracy score than 4.0 as suggested by EIU’s distinction between “authoritarian regimes” and “hybrid regimes”.

On a general note, though, the informative value of such historical simulations is limited under our “naïve” benchmark construction methodology as the risk profile of a custom benchmark and its robustness to different choices for the threshold sorting out countries with too high reputational risks may be highly sensitive to the historical episode which is studied. Hence, one cannot make a convincing case for finetuning the threshold for the democracy score based on historical simulations as long as the benchmark construction procedure does not exhibit any features which allow more control over the risk and return profile of the custom benchmark.

4 “Optimized” Custom Benchmarks

In order to deal in a more systematic way with both higher idiosyncratic risks related to a smaller investible universe and a – potentially time-varying – distorted risk profile regarding duration risk and credit risk, we now turn to exploring a different index construction methodology. Rather than simply scaling up the weights of the issuers which pass the EIU democracy criterion, we now construct a custom benchmark index from the country-specific sub-indices of those compliant issuers by means of minimizing tracking error with respect to the Bloomberg Emerging Markets TR Sovereign Index under the constraints that OAS and OAD should be the same as for that Bloomberg benchmark index for the asset class. We use a window of daily data of one year to carry out the tracking error minimization on each allocation date, so our sample period for evaluating this alternative index construction methodology shrinks by one year and covers only the four full years from 2019 to 2022. As our sample period is one year shorter for the “optimized” methodology, whenever we compare our results for the “optimized” benchmark construction methodology to those of the “naïve” methodology analyzed in section 3, we do this based on an alternative historical simulation of the “naïve” custom benchmarks which comprises only the

years 2019 through 2022 to make sure that we compare like with like. This is particularly relevant as there are no sovereign debt defaults in our sample for the year 2018 and as sovereign debt defaults in the subsequent years account for a large part of the tracking error of any of our custom benchmarks as we discuss in section 5.¹⁴

Tracking error minimization under the constraints of OAS and OAD matching the values of the benchmark for the asset class has the benefit of controlling credit and duration risk and keeping those sources of risk identical to the asset class benchmark in a systematical manner – despite excluding issuers which entail serious reputational risks or credibility issues for Western sovereign wealth funds. This is particularly important from an asset allocator’s perspective who typically resorts to the risk and return properties of broad benchmarks representing the asset class for building the strategic and dynamic asset allocation for a large institutional portfolio. The “naïve” index construction methodology analyzed in section 3 leaves those systematic sources of risk out of the picture, which will generally imply potentially sizable and time-varying deviations in credit risk and duration risk from the broad benchmark for the asset class (cf. Figure 8 and Figure 11).

As Figure 12 shows, unless one moves to very high thresholds for the EIU democracy score where the investible universe becomes extremely narrow, constructing the custom benchmark by means of minimizing tracking error under the constraints that OAS and OAD should match the benchmark for the asset class is a quite successful method for avoiding any systematic biases in credit or duration risk over time and hence for delivering to asset allocator’s needs.

¹⁴ Even when we study the “optimized” benchmark construction methodology in isolation to study its risk properties, we use the same “naïve” custom benchmark as in section 3 with the full universe as our benchmark of comparison, i.e. we do not implement a tracking error optimization to generate a custom benchmark for the full universe of country-specific sub-indices, but rather scale up benchmark weights. As we know the “true” benchmark weights of the issuers in the Bloomberg Emerging Markets TR Sovereign Index and as our country-specific indices account for more than 99% of that index at any single allocation date, it is more accurate to use the “scaled” or “naïve” custom benchmark from the full universe as our benchmark of comparison rather than “guessing” benchmark weights via tracking error optimization. That way, we are more accurate with the custom benchmark for the full universe but still account for tracking error which arises from several issues which are independent from our approach to custom benchmark construction in the narrowed universe, namely missing benchmark adjustments throughout any calendar year, three of our country-specific sub-indices including corporates, and some very small issuers in terms of benchmark weights missing in our dataset. Wherever necessary, we make sure that that same “naïve” custom benchmark for the full universe is based on the reduced sample period from 2019 to 2022.

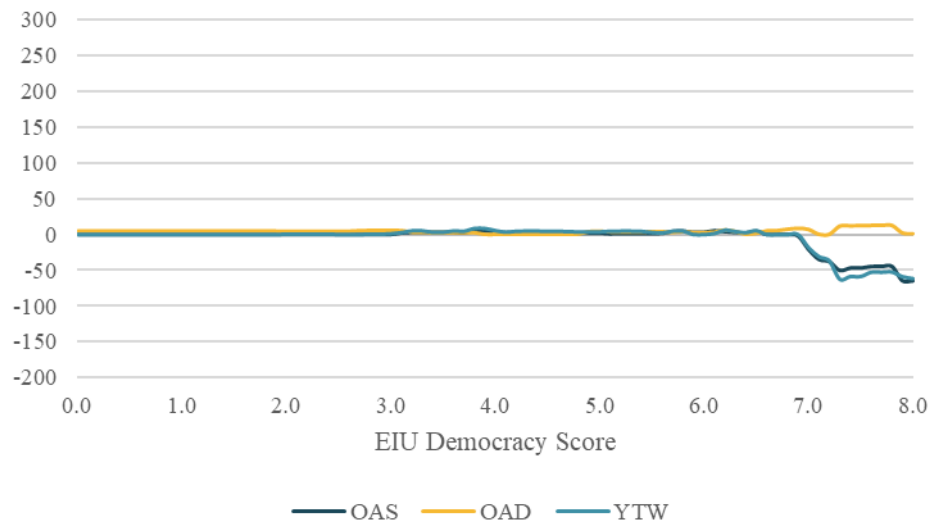


Figure 12: Sample medians of differences in OAS, OAD, and YTW between “optimized” custom benchmark for the universe with EIU democracy score of at least 4.0 and “naïve” custom benchmark for the entire universe; sources: Bloomberg, EIU, own calculations

Index construction based on tracking error minimization can address yet another source of risk in a more systematic manner than the “naïve” methodology both with or without a cap on maximum position size. As deviations in the total return time series from the benchmark for the asset class are punished, this methodology generally avoids too big weights for single issuers and tries to make use of the correlation between various issuers to diversify idiosyncratic risks in a narrower investible universe in a way which comes as close as possible to the benchmark for the full universe. Hence, this way of constructing a custom benchmark index should provide a superior way of dealing with idiosyncratic risks and prevent the weights for single issuers from becoming too large – even without imposing caps on benchmark weights. Figure 13 shows the maximum weight in the custom benchmark indices on each single day over the four-year sample period from 2019 to 2022 under the “naïve” benchmark construction method with and without a cap and under the “optimized” method with an EIU democracy score of 4.0 as well as for the “naïve” custom benchmark for the full universe.¹⁵ As Figure 13 shows, using tracking error minimization as the method for index construction, one obtains maximum weights for single issuers which tend to be even lower than what one observes under the “naïve” index construction methodology with a cap and also somewhat lower than in the full universe. Hence, that more sophisticated way of constructing a custom benchmark deals with idiosyncratic risks at least as well as imposing the cap on maximum position size in the “naïve” approach.

¹⁵ As pointed out in footnote 14, for the full universe, we generally use the “naïve” method as this approach yields results which are virtually identical to the actual parent index on annual allocation/rebalancing dates and implies a similar behavior of weights throughout any given year as for our custom benchmark indices constructed from the restricted universe based on EIU democracy scores.

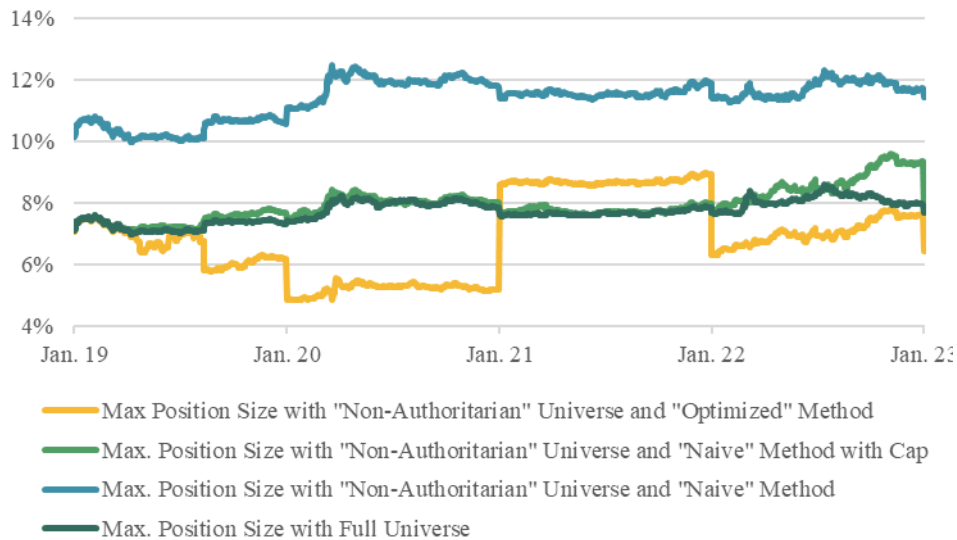


Figure 13: Daily time series of maximum position sizes under various index construction methods for custom benchmarks; “Non-Authoritarian Universe” refers to an EIU democracy score of at least 4.0; sources: Bloomberg, EIU, own calculations

This becomes also apparent if one looks at the tracking error which the “optimized” benchmark construction methodology produces over our sample period. Using an EIU democracy score of 4.0 as our threshold to sort out countries with high reputational risks for Western sovereign wealth funds, one obtains a tracking error of 1.46% p.a. with respect to the Bloomberg Emerging Markets TR Sovereign Index. This is 42 basis points lower than the value of 1.88% p.a. which we obtain for the uncapped “naïve” benchmark methodology with an EIU democracy score of 4.0 in the limited sample period from 2019 to 2022 and still 38 basis points lower than what we find for the capped version over that sample period. Hence, using the optimization-based approach to constructing our custom benchmark index significantly reduces tracking error with respect to the asset class benchmark.

Using the “optimized” methodology also keeps the beta with respect to the Bloomberg Emerging Markets TR Sovereign Index at 1.00 even though this was not imposed as a constraint during the optimization process. For the “naïve” methodology we obtain a beta of 1.08 with respect to that broad benchmark index for the asset class in the shorter sample period from 2019 to 2022 regardless of imposing the cap on maximum position size or not. Consequently, monthly returns are even higher correlated with the Bloomberg benchmark index in the “optimized” case: The correlation rises from 98.5% to 99.5% as we move from the uncapped “naïve” to the “optimized” method over the sample period from 2019 to 2022. The downside to these improvements is that the “optimized” benchmark construction method requires significantly higher portfolio turnover at the annual rebalancing dates. For an EIU democracy score of 4.0 as our threshold, we calculate portfolio turnover of 21.4% p.a. for the “optimized” way of constructing our custom benchmark, while for the comparable sample period, we find turnover statistics of 6.0%

p.a. and 5.9% p.a. under the “naïve” benchmark construction methodology with and without the cap on maximum position size, respectively.

Figure 14 shows that in our historical simulations over the years 2019 through 2022, the “optimized” methodology delivers a lower tracking error than the “naïve” method for any choice of the threshold for the EIU democracy score between 3.0 and 6.0. As the investible universe is not narrowed down in any material way at thresholds below 3.0 (cf. Figure 2) and as 6.0 represents the watershed between “hybrid regimes” and “flawed democracies” according to EIU’s classification, the range between 3.0 and 6.0 is arguably the relevant parameter space for potential thresholds for the EIU democracy score to address reputational risks in a meaningful way. The “optimized” custom benchmark methodology delivers superior outcomes regarding tracking error over that entire range.¹⁶

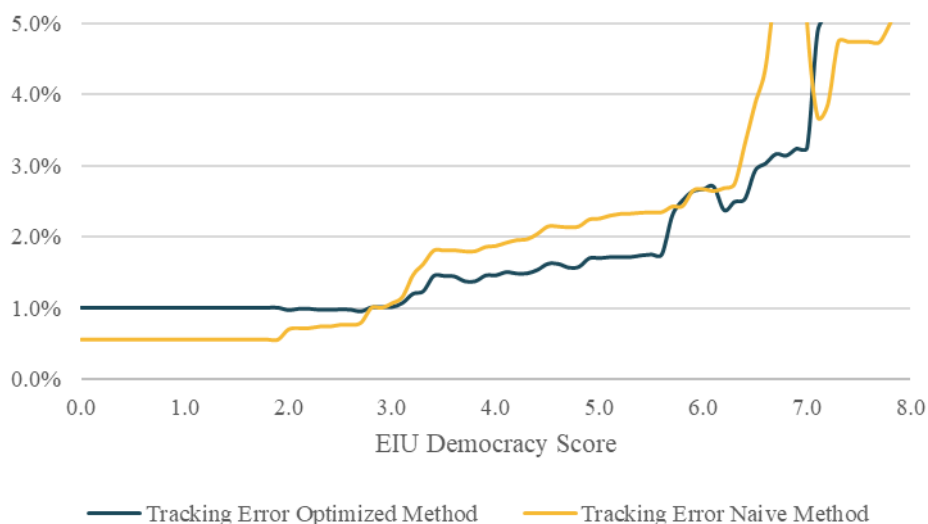


Figure 14: Annualized tracking error for custom benchmarks based on “optimized” and “naïve” benchmark construction methodology with different thresholds for EIU democracy score; sample period 2019-2022; sources: Bloomberg, EIU, own calculations

In addition, as Figure 15 demonstrates, the “optimized” methodology for custom benchmark construction is successful at keeping the beta of our custom benchmark to the Bloomberg Emerging Markets TR Sovereign Index close to 1.00 over the entire relevant range of values for the EIU democracy score. Under the “naïve” approach,

¹⁶ The tracking error implied by the “optimized” method exceeds the one for the “naïve” method for low values of the threshold for the EIU democracy score as the optimization algorithm needs to infer the “true” benchmark weights for the full universe from a single year of daily index performance data at any annual allocation date, while the “naïve” method has the big advantage of essentially being told the “true” index weights for the case of the full universe, which is exactly equivalent to the reduced universe for EIU democracy scores up to around 2.0.

by contrast, there is no guarantee that the beta of the resulting custom benchmark will be close to 1.00 as the beta turns out to be significantly higher for any choice of threshold for the EIU democracy score over the relevant range during our sample period.

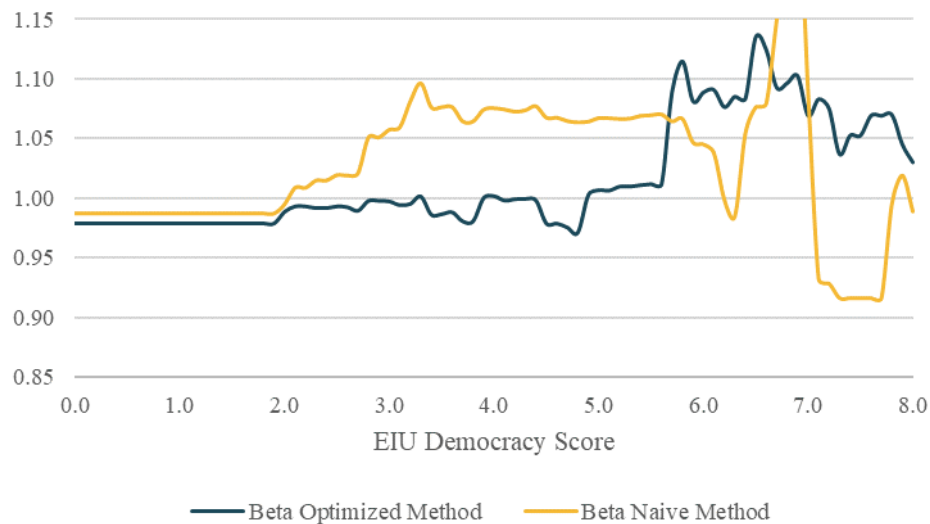


Figure 15: Beta with respect to Bloomberg Emerging Markets TR Sovereign Index for custom benchmarks based on “optimized” and “naïve” benchmark construction methodology with different thresholds for EIU democracy score; sample period 2019-2022; sources: Bloomberg, EIU, own calculations

To summarize, the optimization-based approach to constructing a custom benchmark based on a narrower investible universe delivers superior outcomes in the sense that it implies lower tracking error, that it systematically keeps credit and duration risk and index beta in line with the broad benchmark for the asset class, and that it handles idiosyncratic risks of single issuers in a more careful manner than the “naïve” approach of simply scaling up weights of the remaining issuers in the universe after throwing out those with too high reputational risks. These advantages do come, however, at the drawback of a much higher turnover and a significantly more involved way of constructing the custom benchmark. In practice, these drawbacks may pose serious challenges in the practical management of such portfolios – especially if external benchmark providers, custodians, asset managers etc. are involved.

5 Custom Benchmarks and Sovereign Bond Defaults

Throughout this paper, our focus is on reputational rather than default risks associated with investments in emerging markets sovereign bonds. However, it is interesting to ask to which extent addressing reputational risks

by excluding countries with poor democracy scores also helps with avoiding sovereign default events. Admittedly, our sample period is too short for thoroughly answering that question. But there are several events of sovereign debt defaults in that short sample period, so we can at least resort to some case studies to convey some basic – and arguably important – insights. Table 1 shows the instances of sovereign debt default in our dataset and the EIU democracies scores which were applicable at the respective time of default where we follow the timing assumption from our simulation exercises of lagging the scores by two years given that the score for year x is not published until some point in year $x + 1$.

Sovereign Debt Default Event	EIU Democracy Score Lagged by Two Years
Argentina 2019	6.96
Venezuela 2019	3.87
Ecuador 2020	6.27
Zambia 2020	5.61
Ghana 2022	6.50
Sri Lanka 2022	6.14
Russia 2022	3.31

Table 1: Events of sovereign debt default in our sample and “latest” EIU democracy scores at point of time of default; sources: EIU, own research

Table 1 makes one very basic point: Five out of seven countries had EIU democracy scores well above the threshold of 4.0 at the time of defaulting on (some of) their external debt. Hence, using such scores to address reputational risks clearly does not help with avoiding sovereign defaults. The same message comes out of Figure 4 in section 2: Credit spreads as a measure for (perceived) default risk are only mildly negatively correlated with EIU democracy scores and that correlation disappears completely as soon as one takes the benchmark weights of the various issuers into account. Investors are compensated for default risk in emerging markets hard currency sovereign bonds by relatively high risk premia and coupons (cf. Meyer, Reinhart, and Trebesch (2022)). This is the way to deal with default risk and related financial risks in that asset class. The idea of employing EIU democracy scores we pursue in this paper does not have anything to do with circumventing default risk in emerging markets, but with the risk of authoritarian regimes engaging in practices and actions which do not necessarily trigger sovereign default, but which are generally hard to reconcile with the fundamental values of Western democracies and which may thus raise reputational risks for a sovereign wealth fund regarding the public debate in its home country.

Consequently, it would be wrong to expect that on average, any of the methods for constructing custom benchmarks with the help of EIU democracy scores would reduce the sovereign default exposure of a portfolio managed against such a custom benchmark in any material way. However, as long as the threshold for the democracy score is chosen ambitiously enough so that non-negligible parts of the broad benchmark index for the asset class are ruled out, there will necessarily be significant deviations between the weights assigned to each single issuer by a custom benchmark and the broad benchmark. The “naïve” way of constructing a custom benchmark will necessarily result in custom benchmarks which are overweight in any issuer with an EIU democracy score above the threshold and underweight in all remaining issuers. Although the “optimized” approach to benchmark construction has a little more flexibility in that regard and could in principle be underweight in issuers with sufficiently high democracy scores, too, it will to a large extent exhibit a similar pattern of overweights and underweights. As a result, the occurrence of a sovereign debt default in the asset class will generally cause a substantial amount of tracking error and necessarily imply a deviation in the performance of a custom benchmark from the broad asset class benchmark. Depending on whether the defaulting country exhibits a democracy score above or below the relevant threshold for being included in the custom index, the decline in its bond prices associated with a debt default will push towards an underperformance or outperformance of the custom benchmark in comparison to a broad benchmark for the asset class such as the Bloomberg Emerging Markets TR Sovereign Index.

To illustrate these points and to check on potential differences as to how the two index construction methods behave on the occasion of sovereign debt defaults, we examine the behavior of our custom benchmark indices with a threshold for the EIU democracy score of 4.0 around the defaults of Argentina in August 2019 and around the Russian invasion of Ukraine in February 2022. These two events are particularly interesting to study for various reasons: First, at the respective point in time of defaulting, Argentina and Russia were much larger issuers in terms of benchmark weights in the Bloomberg Emerging Markets TR Sovereign Index than most other defaulting issuers listed in Table 1. Hence, in these two cases, we are able to study quite sizable implications for the outperformance or underperformance of our custom benchmark indices in default episodes. Second, for these two debt defaults we observe a substantial and rapid decline in bond prices within a few days so that by focusing on bond performance over one or two months around the debt default event, we can isolate the effects of such a default without capturing too many other aspects. Such a rapid and substantial decline in bond prices did not occur in most of the remaining episodes listed in Table 1 where bond prices gradually started declining into depressed territory in anticipation of a sovereign debt default over many months or where a rapid decline in bond prices coincided with the Covid selloff across most markets for risky assets in spring 2020 thus affecting the bond prices

of non-defaulting countries in roughly similar ways. And third, with these two events we cover both the case of a country with an EIU democracy score above the threshold leading to an overweight in our custom benchmark and one with a score below the threshold and hence an underweight in the custom benchmark.

Argentina 2019: The Argentine government announced a postponement of debt service on both short-term and long-term debt and a renegotiation with the IMF in August 2019. The country-specific sub-index of the Bloomberg Emerging Markets TR Sovereign Index for Argentina thus declined by 50.7% from July 31, 2019, to August 31, 2019. Given that Argentina exhibited an EIU democracy score of 6.96 in the 2017 ranking, both our “naïve” and our “optimized” custom benchmarks with a threshold of 4.0 for the EIU democracy score would have been overweight Argentina in the simulated time series in comparison to the respective custom benchmark with the full universe of all countries for which we have data. Specifically, the “naïve” custom benchmark without a cap on issuer weights and the EIU democracy score threshold of 4.0 places a weight of 10.11% on Argentina on July 31, 2022. This represents an overweight in Argentina of 3.00 percentage points compared to the custom benchmark with the full universe of issuers. As a result, the decline in the country-specific bond price index for Argentine sovereign debt implies a quite substantial underperformance of our custom benchmark with the reduced universe of “non-authoritarian” countries compared to the custom benchmark with the full universe: That underperformance amounts to 1.52 percentage points in August 2019. All in all, the uncapped “naïve” custom benchmark which rules out issuers with an EIU democracy score of 4.0 underperforms the custom benchmark with the full universe of issuers by 1.95 percentage points in August 2019 with the second-biggest negative contribution of 0.34 percentage points coming from an underweight of Saudi-Arabia and the biggest positive contribution of 0.12 percentage points resulting from an overweight of Mexico. Thus, the overweight in Argentine sovereign debt implied by the objective to rule out countries with high reputational risks would have been by far the major driving force behind the underperformance of the custom benchmark over August 2019 when Argentina defaulted again on its debt.

Russia 2022: The Russian invasion of Ukraine in February 2022 led to a write-down of Russian government debt and to an exclusion of Russian bonds from several widely used emerging markets bond indices. Thus, the country-specific index for Russia which we use throughout this paper exhibits a loss of 100.0% from January 31, 2022, to March 31, 2022. But the country-specific sub-indices of the Bloomberg Emerging Markets TR Sovereign Index for Belarus and Ukraine exhibited large losses of 77.5% and 47.6% over that period, too. Due to 2020 EIU democracy scores of 5.81 for Ukraine, 3.31 for Russia, and 2.59 for Belarus, the uncapped “naïve” custom benchmark with a threshold for the EIU democracy score of 4.0 would have been overweight in Ukraine and underweight in Russia and Belarus as of January 31, 2022. The total weights as of January 31, 2022, would have amounted to 2.23% for Ukraine and 0.00% for Russia and Belarus in the uncapped “naïve” custom benchmark

with exclusions to address reputational risks. This represents an overweight of Ukraine by 0.79 percentage points and underweights of Russia and Belarus by 3.48 and 0.27 percentage points, respectively, in comparison to the same kind of custom benchmark with the full universe of all issuers in our dataset. The underweights in Russia and Belarus obviously push towards an outperformance of the custom benchmark with the exclusions of countries with too poor democracy scores over that episode. The underweight in Russia translates into 3.48 percentage points of outperformance in comparison to the “naïve” custom benchmark with the full universe over the period from January 31, 2022, to March 31, 2022. The underweight in Belarus adds 0.21 percentage points of outperformance to that. By contrast, the overweight in Ukraine costs 0.38 percentage points of performance relative to the custom benchmark for the full universe over that period. Hence, the total contribution of the “active positioning” in these three issuers amounted to 3.31 percentage points of outperformance implied solely by the democracy criterion in the custom benchmark. All in all, the uncapped “naïve” custom benchmark with the exclusions outperforms the “naïve” custom benchmark with the full universe by 3.06 percentage points in February and March 2022, so all the remaining over- and underweights combined imply only 0.26 percentage points of underperformance. This illustrates once again that on the occasion of sovereign bond defaults, our custom benchmark methodology will generally lead to relatively large outperformances or underperformances relative to the broad benchmark for the asset class.

In fact, episodes of sovereign debt default in our sample account for a large part of the tracking error which we actually observe in our custom benchmarks. To see this, one can look once again at the scatterplot of monthly performance figures of our “naïve” custom benchmark with an EIU democracy score of 4.0 compared to the Bloomberg Emerging Markets TR Sovereign Index as displayed in Figure 7. Figure 16 plots the same monthly performance time series as Figure 7 and highlights the three biggest outliers. It turns out that the three biggest outliers on that chart are directly associated with the two events of sovereign debt default in our sample which have just been analyzed in greater detail. Calculating tracking error with respect to the Bloomberg Emerging Markets TR Sovereign Index based on these monthly return time series, it turns out that the annualized tracking error declines by 30.5% if one simply leaves out these three months. Hence, a major conclusion of our paper is that one of the biggest sources of risk in terms of tracking error for our custom benchmarks is the idiosyncratic risk of sovereign debt default.

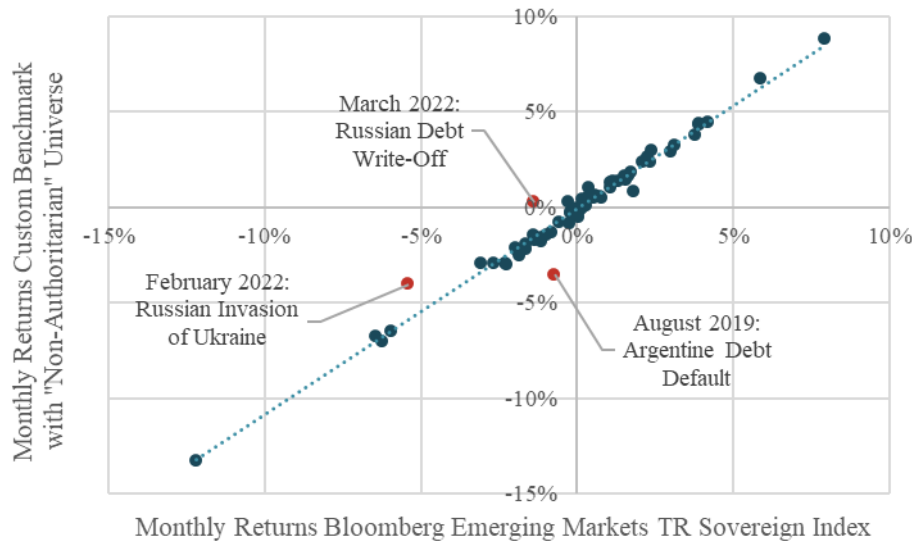


Figure 16: Monthly returns in simulated time series with uncapped “naïve” weighting method for a custom benchmark index based on universe with EIU democracy score of at least 4.0 versus Bloomberg Emerging Markets TR Sovereign Index; outliers related to sovereign bond defaults highlighted; sources: Bloomberg, EIU, own calculations

That source of tracking error cannot be addressed completely by any type of custom benchmark construction methodology if one wants to mitigate reputational risks for Western sovereign wealth funds by ruling out countries with poor scores on democracy, human rights, and related fundamental pillars of Western societies. If that is the objective, there is simply no other way but to be underweight such countries with respect to the broad benchmark for the asset class and to be overweight all countries with acceptable scores. But that in turn implies the potential for significant outperformance or underperformance in comparison to the broad benchmark in the case that some issuer in the entire universe of emerging markets hard currency sovereign bonds does default, which is not a rare thing to observe in that asset class as Table 1 illustrates.

What can be done, however, is to limit the impact of sovereign debt defaults on underperformance with respect to the broad benchmark for the asset class by means of limiting the benchmark weight of any single issuer. This can either be done in a mechanical way by employing the “naïve” benchmark construction methodology along with a cap or by resorting to the “optimized” approach to constructing the custom benchmark. Figure 17 and Figure 18 repeat the exercise from Figure 16 with the cap on maximum position size added to the “naïve” benchmark construction methodology and with employing the optimized methodology for benchmark construction, respectively. In both cases, the outliers related to Argentina’s debt default in August 2019 and Russia’s invasion of Ukraine in February 2022 and March 2022 start looking much less like outliers in comparison to the “naïve” methodology without the cap on maximum position size as displayed in Figure 16. This is particularly true for the “optimized” way of constructing the benchmark (cf. Figure 18). In fact, while these three months accounted for

about 30.5% of tracking error in the case of the uncapped “naïve” custom benchmark methodology from Figure 16, that number declines to 15.4% for the capped “naïve” custom benchmark and to 14.1% for the “optimized” benchmark construction methodology as displayed in Figure 17 and Figure 18, respectively.¹⁷

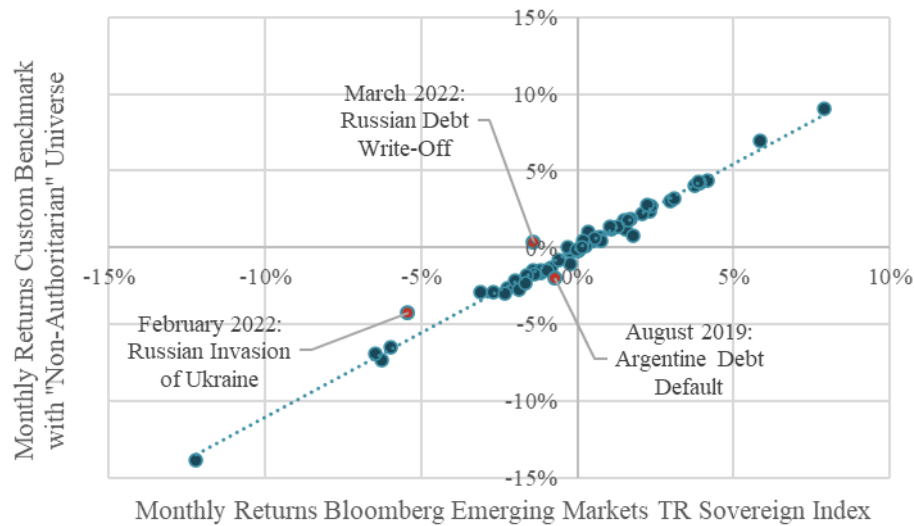


Figure 17: Monthly returns in simulated time series with capped “naïve” weighting method for a custom benchmark index based on universe with EIU democracy score of at least 4.0 versus Bloomberg Emerging Markets TR Sovereign Index; outliers related to sovereign bond defaults highlighted; sources: Bloomberg, EIU, own calculations

¹⁷ For the “naïve” custom benchmarks, Figure 16 and Figure 17 are based on the full sample including the year 2018, while Figure 18 covers only the period from 2019 to 2022. If one does the same exercise for the uncapped and capped “naïve” custom benchmarks based on the shorter sample period from 2019 to 2022 to make the numbers regarding the fraction of tracking error attributable to the debt default events in August 2019 and February/March 2022 comparable, one finds that these three months account for 32.2% and 15.5% of tracking error in the uncapped and capped “naïve” versions of the custom benchmark with an EIU democracy score of 4.0, respectively.

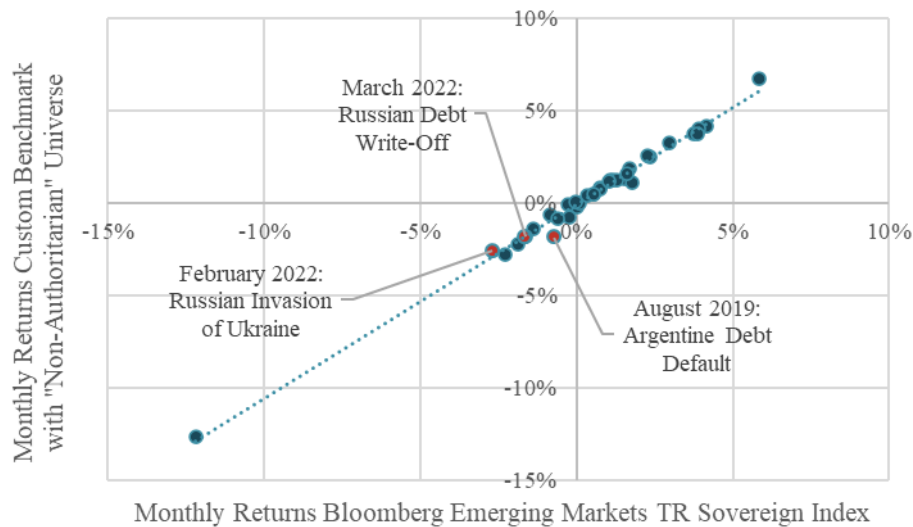


Figure 18: Monthly returns in simulated time series with “optimized” weighting method for a custom benchmark index based on universe with EIU democracy score of at least 4.0 versus Bloomberg Emerging Markets TR Sovereign Index; outliers related to sovereign bond defaults highlighted; sources: Bloomberg, EIU, own calculations

The strong underperformance of the country-specific sub-indices for Argentina in August 2019 and for Russia, Ukraine, and Belarus in February and March 2022, which the custom benchmarks have to deal with, is evidently the same regardless of the approach to custom benchmark construction one chooses. Nonetheless, by putting lower weights on large issuers in the benchmark such as Argentina, the capped “naïve” approach and the “optimized” approach fare closer to the broad benchmark for the asset class in those periods. While the “naïve” custom benchmark implies 1.52 percentage points of underperformance from being overweight 3.00 percentage points in Argentina over August 2019, the “optimized” strategy would have even been underweight by 0.05 percentage points in Argentina in August 2019 and was thus hardly affected at all in relative performance terms by the debt default. On the other hand, as any benchmark construction methodology would have assigned a weight of zero to Russia and Belarus due to their EIU democracy score being lower than 4.0, the underweights in Russia and Belarus would have been the exact same ones in all cases, so there are only small differences in the outperformance of the various benchmark strategies over February 2022 and March 2022 resulting from a different size of the disadvantageous overweights of Ukraine.

Hence, limiting idiosyncratic issuer risks by either putting caps on benchmark weights in the “naïve” benchmark construction process or by turning to the “optimized” approach for custom benchmark construction reduces tracking error and makes tracking error less dependent on sovereign debt default events. But that only works to the extent that sovereign debt defaults happen at issuers which are above the threshold for the EIU democracy

score – as in the case of Argentina in August 2019. Those are the debt defaults which are costly in relative terms as these countries are by construction overweighted by any custom benchmark which is constructed from a narrower universe of countries which do not pose reputational risks to Western sovereign wealth funds. Both the “naïve” methodology with a cap and the “optimized” methodology are helpful with reducing underperformance risks and tracking error associated with these types of debt defaults. If, by contrast, sovereign debt defaults happen at issuers which are ruled out by the democracy score, any benchmark construction methodology will just do as well as the relative underweight of such issuers will be the same. The tracking error resulting from such events is “good” tracking error, though, as a country being sorted out by the EIU democracy score defaulting will imply a relative outperformance.

6 Concluding Remarks

Both the “naïve” and the “optimized” approach we study throughout this work are equally good at addressing reputational risks for Western sovereign wealth funds associated with emerging markets debt investments if one chooses the same threshold for the democracy score to narrow down the investible universe. In our historical simulations, both approaches deliver a risk and return profile which is not too far from the broad benchmark for the asset class. Thus, our analysis makes a strong case for Western sovereign wealth funds to remain invested in the asset class as the historically highly attractive risk and return profile can in principle be harvested with a narrower investible universe and an accordingly designed custom benchmark, too. The “naïve” approach has the advantage of being easy to implement if external benchmark providers, asset managers, and custodians are involved and exhibits low turnover. In that regard, challenges are much larger with our optimization-based approach. However, the optimization-based approach is much more reliable in systematically delivering an undistorted risk and return profile, while the promising results we document for the “naïve” strategy could potentially be pure coincidence against the backdrop of our relatively short sample of five years of data.

The democracy scores we use are not significantly correlated with credit spreads as a measure of perceived default risk. Hence, one must not expect that using them to build custom benchmarks makes these benchmarks immune to events of sovereign debt defaults. In fact, episodes of sovereign debt default account for a large part of tracking error of our custom benchmarks. Even though our custom benchmarks will generally suffer in terms of absolute performance during such episodes, our optimization-based approach delivers an interesting asymmetry around such events mitigating underperformance and fully harvesting outperformance from such events.

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