SYNTHETIC ACCESS TO THE EM LOCAL BOND MARKET

Replicating EM Risk Premia

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Replicating EM risk premia

Synthetic access to the EM local bond market

The emerging market (EM) risk premium can be viewed as the excess return investors receive as compensation for taking on the risks associated with the greater economic and political uncertainty of developing economies. In an earlier paper (*It's Almost All in the Currency Exposure*, January 2012), we highlighted that most of the outperformance of the EM asset class relative to developed counterparts can be explained by exposure to local short interest rates and embedded FX exposure. We expanded on this finding by highlighting the existence of a common factor driving returns across different EM investments. This common factor can be interpreted as the EM risk premium capturing macroeconomic differentials relative to developed markets. Based on this insight, we outlined a simple method to synthetically replicate EM-like returns using liquid developed-market instruments to source duration exposure and EM currency overlays to source the additional EM risk premium.

In this note, we deepen the analysis of risk premia embedded in EM local currency debt and provide tradable implementations for gaining synthetic cost-efficient access to this asset class.

- We provide a deeper understanding of EM local debt returns by decomposing the source of returns into four risk-premia components. While most of the EM risk premium is captured through FX (or short maturity rates) positions, we introduce credit as an additional source of EM returns to enhance the replication versus the chosen benchmark.
- The synthetic replication methodology we propose provides investors with liquid, funded or unfunded, index-based access to different types of emerging market fixed income returns, including broad local nominal and inflation-linked government bond indices, single country indices, and single bond indices.
- Synthetic replication gives foreign investors liquid access to certain EM local bond markets where direct exposure is complex or costly. We highlight the main structural impediments to foreign investors' participation in local bond markets, which include capital controls and prohibitive tax regimes, and we give examples of synthetic replication for countries where such restrictions are in place.
- Constraints and complexities associated with local debt investments are often circumvented by investing in global bonds that are designed to be more accessible. However, these instruments inherently introduce additional risks and in most cases are more expensive than their peer group. Drilling down further into EM local investments, we discuss the benefits of synthetic replication versus global bonds.

1. Overview

Until the 1990s, EM fixed income consisted primarily of US dollar-denominated government bonds with relatively limited liquidity. Over time, the EM fixed income asset class has developed to include a wide variety of government and corporate bonds, issued both in local and hard currency. This evolution is facilitated by increasingly disciplined monetary and fiscal policies in emerging market countries, which have lowered investors' concerns about realised inflation, currency devaluation and bond defaults. These policies have resulted in a steadily increasing credit quality of EM issuers, with many now rated investment grade. In addition, the shift for most EM countries from pegged[1] to floating currencies acts like a natural macroeconomic shock absorber in adverse market conditions, through a competitive depreciation. The combination of rising credit quality and fundamental improvements in emerging markets countries has attracted new investors to the asset class, expanding the investor base.

Demand- and supply-side dynamics have both contributed to the rapid growth in the size and scope of EM debt markets. On the supply side, emerging market governments are issuing local currency bonds to eliminate mismatch risk between revenues denominated in local currency and debt denominated in foreign currency. Some EM governments are steadily paying off external debt and issuing new debt in local currency. The demand side is growing, driven by both local and foreign investors. As part of the maturation process, many EM countries have implemented pension reforms, which have led to increased demand among local pensions for local currency bonds as a hedge against long-term liabilities. Fixed income foreign investors have generally become more comfortable with the EM asset class and started moving into local currency bonds over the past few years driven by a quest for yield.

Emerging market local currency bonds have usually provided investors with excess returns for taking on risks specific to the EM markets. The key features of EM debt investments typically include attractive yields, potential price increases stemming from rising credit quality, currency appreciation and diversification.

Developing the concept: It's almost all in the currency exposure

In an earlier paper (*It's Almost All in the Currency Exposure*, January 2012) we explored the historical risk-reward characteristics of the Emerging Markets (EM) asset class to gain investment insights. While historical returns in debt and equity markets on EM investments compare favourably to their counterparts in developed markets, most of the out performance can be explained by exposure to local short interest rates and embedded FX exposure. We expand on this finding by highlighting the existence of a common factor driving total returns across different EM investments, which can be interpreted as the EM risk premium that captures macroeconomic differentials relative to other markets. The macro risks driving the EM risk premium are, in large part, captured through the FX exposure embedded in local instrument investments, while instrument-specific risk factors, such as credit, inflation, and equity risk, are of lesser importance in explaining differences in performance of EM indices relative to their developed market counterparts. The investment consequences are significant. First, while common exposure to the EM risk premium and sentiment-driven flows imply high correlations for EM investments, balanced EM investments still capture diversification benefits relative to the broad equity-only exposure often favoured by investors. Second, and perhaps most important, the understanding that excess returns on EM investments are captured mainly through currency exposure suggests the possibility that we can synthetically achieve EM-like returns using liquid developed-market instruments with EM currency overlays.

[1] Typically to the US dollar

The synthetic format enables foreign investors to overcome various obstacles associated with direct exposure to the EM local bond market, including poor liquidity, regulatory uncertainty, underdeveloped local market infrastructure (eg, settlement requirements), potential tax distortions (eg, 6% Brazilian IOF tax) and local barriers to entry (eg, capital controls in India and Taiwan). Furthermore, synthetic replication allows both funded and unfunded liquid access, which naturally increases the investment and hedging opportunities, for instance allowing investors to take short positions to hedge cash portfolios. Building on this analysis, we explore in more detail the risk premium embedded in EM local currency debt and decompose the risk premium into multiple components. We demonstrate that each of the main components can be accessed through a combination of tradable building blocks, enabling us to construct a synthetic tradable replication of the EM local debt benchmarks. Finally, we show examples of this synthetic replication for both specific countries and bonds, where direct exposure can prose problems of accessibility, cost and risk management.

2. Decomposing the risk premium of local currency debt

Emerging market issuers generally pay a considerable premium over comparable "risk-free" assets such as US Treasury securities (denominated in US dollars). Conceptually, this premium can be broken down into three components as follows.

We consider the yields to maturity on debt instruments which may differ in terms of issuer, currency of denomination and jurisdiction of issue, but that are identical in all other respects:

y^{EM}_{Local}	Yield to maturity on local-currency debt issued onshore by an EM government issuer
$y^{EM}_{Foreign}$	Yield to maturity on foreign-currency debt (eg, denominated in US dollars) issued onshore by an EM Sovereign issuer[2]
$y^{EM}_{Foreign,Offshore}$	Yield to maturity on foreign-currency debt (eg, denominated in US dollars) issued offshore (eg, issued in New York) by an EM Sovereign issuer[2]
y^{US}	Yield to maturity on a benchmark "risk-free" instrument (eg, US Treasury debt (denominated in US dollars) issued in New York

We can write the following expression:

$$\underbrace{\left(y^{EM}_{Local} - y^{US}\right)}_{\text{Total risk premium}} = \underbrace{\left(y^{EM}_{Local} - y^{EM}_{Foreign}\right)}_{\text{Currency premium}} + \underbrace{\left(y^{EM}_{Foreign} - y^{EM}_{Foreign,Offshore}\right)}_{\text{Jurisdiction premium}} + \underbrace{\left(y^{EM}_{Foreign,Offshore} - y^{US}\right)}_{\text{Credit premium}}$$

This conceptual formula shows that the EM local debt risk premium can be broken down into three components:

1. **Currency premium:** This reflects both: 1) the risk associated with a move in the FX spot rate, ie, the risk that the EM country currency depreciates against a reference currency; and 2) the risk associated with a change in the short-term interest rate differential between the EM and a reference country. The spot FX risk is closely linked to the risk of inflation or dilution. In fact, as sovereigns have full control over their own currency, they can print money to make promised payments on their local currency debt. Printing money usually leads to increased inflation which erodes the real value of their local debt, but also tends to result in a devaluation of their currency. The second source of risk is

[2] We assume identical default risk as for the local-currency debt. This assumption is only used for our conceptual formula, as in practice, foreign-currency debt has higher default risk than local-currency debt.

linked to growth differential risk and structural uncertainties between emerging and developed market countries. These two sources of risk are the same one faced by an FX carry trade investor who is mainly exposed to 'crash' risk or 'flight to quality' risk (see *The EM FX carry premium*, September 2010). This is the risk of sustaining large, sudden losses associated with an adverse move in the FX spot rate. The likely cause is the deterioration of market sentiment following economic data releases (depreciation of the EM currency) or government action (either fuelling higher inflation through monetary growth or excess debt issuance).

2. **Jurisdiction risk premium:** This reflects the risk stemming from differences between domestic (onshore) and international (offshore) financial regulations. Local and international laws relating to financial investments drive differences in perception of jurisdictional risk. For example, the perceived differences in the mutability of regulations pertaining to local debt, the susceptibility of investments to suffer from write-downs or the introduction of collective action clauses[3]. Jurisdiction risk varies between financial centres.

3. **Credit risk premium:** This reflects the risk of issuer default and includes cases where the issuer is unwilling or unable to service its debt (interest payments and principal repayments) or restructures its debt (which may involve extending the period of repayment, reducing the total amount owed or reducing the interest). Historically, sovereigns who borrow in local currency have tended to use inflation to erode the real value of their local debt obligations as opposed to defaulting or restructuring it. The disincentive to default is in part driven by the fact the investor base for local assets tend to be the domestic buy and hold community.

An alternative way of expressing the above formula is the following:

$$y^{EM}_{Local} = y^{US} + \left(y^{EM}_{Local} - y^{EM}_{Foreign}\right) + \left(y^{EM}_{Foreign} - y^{EM}_{Foreign,Offshore}\right) + \left(y^{EM}_{Foreign,Offshore} - y^{US}\right)$$

Duration risk | Currency premium | Jurisdiction premium | Credit premium

This conceptual formula shows that in addition to the three risk premia components described previously, the yield (and hence the return) on EM local debt subsumes duration risk which can be replicated by using the debt of a reference country such as US Treasury debt. Duration risk can be decomposed into returns coming from accrued coupons, changes in the (clean) bond price[4] and roll down along the yield curve.

We are able to replicate the three most significant variables – duration, currency and credit factors. Duration is naturally important in any bond replication. Currency risk is a significant driver for the reasons mentioned above, and the credit premium contributes to a smaller extent by virtue of the fact the country controls its own money. The jurisdiction premium is difficult to quantify but also varies between countries (idiosyncratic risk). When we look at replicating a cross-EM basket, we assume this effect is mitigated and don't consider it as a replication factor.

[3] Collective action clauses allow a supermajority of bondholders to agree to a debt restructuring that is legally binding on all holders of the bonds; such clauses have become much more common since Argentina defaulted on its debt in December 2001, where bondholders lost 70% of their value, as they are now seen as potentially a means of avoiding more drastic action.
[4] Approximately equivalent to changes in yield times duration

3. Synthetic replication of EM local nominal debt

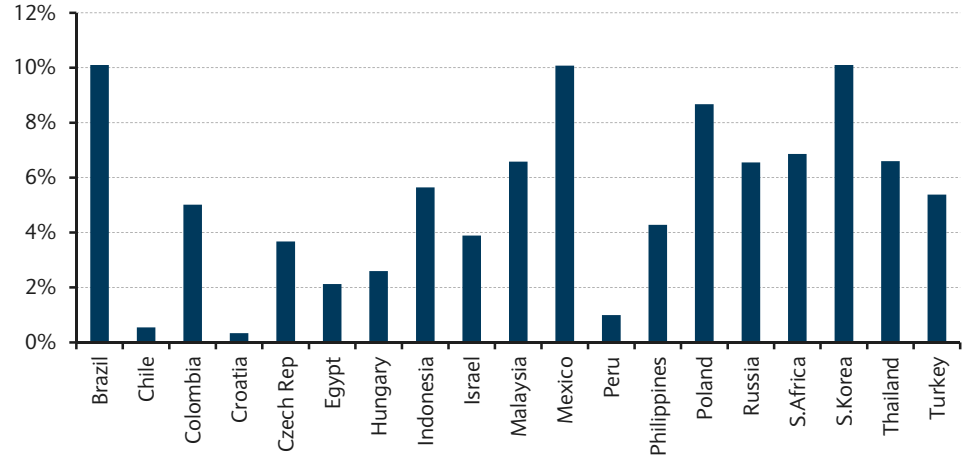
In this section, we propose a simple and transparent framework to synthetically access the EM local debt market. We demonstrate that each of the main sources of return can be accessed through discrete tradable building blocks and we develop a synthetic replication of an emerging market local currency nominal bond benchmark index: *Barclays EM Local Currency Government - 10% Country Capped Index*[5]. The main construction details of this benchmark index are described below:

- *Country inclusion:*
  - **Asia Pacific:** Indonesia, Malaysia, Philippines, South Korea, Thailand
  - **EMEA:** Croatia, Czech Rep, Egypt, Hungary, Israel, Nigeria, Poland, South Africa, Romania, Russia, Turkey
  - **LATAM:** Argentina, Brazil, Chile, Colombia, Mexico, Peru
- *Weights:*
  - Country exposure is determined using the market value weight of the country's index-eligible debt
  - Limits country exposure to a maximum of 10% of the overall index and redistributes the excess market value index-wide on a pro rata basis
- *Amount Outstanding:* Fixed local currency minimum amount outstanding is set for each market.[6]
- *Rebalancing:* Index composition is determined each month and is rebalanced on the last business day of each month
- *Embedded costs:* none

The average historical modified duration of the benchmark index has been 4.5[7]. Figure 2 shows the average allocation (market value weight) to each country (calculated over the past one year) within the Barclays EM Local Currency Government 10% Country Capped Total Return Index.

FIGURE 1

Average allocation (past one year) to each country within our nominal benchmark



Source: Barclays Research

[5] Which is more balanced in terms of country allocation than uncapped benchmark indices (like the flagship Barclays EM Local Currency Government Index).For the purpose of this analysis the returns are USD unhedged. The EM Local Currency Government 10% Country Capped Index is available on Bloomberg: EML1TRUU

[6] Please refer to index *fact sheet* for more detail

[7] The range used to calculate the average duration was August 2008 to August 2013.

Synthetic replication – duration and currency factors

We build a replicator using an iterative approach, first using the duration and currency factors and later adding the credit factor:

- *Duration component*: we use an index that replicates the total return performance of investing in USD 5y receiver nominal interest rate swaps, namely the Barclays USDFix 5y Nominal Swap Total Return Index[8]. Using a swap index as opposed to a treasury one has the benefit of allowing access to the EM local currency synthetic replication in a cost-efficient way in both funded and unfunded formats. In fact, one can use the excess return version of the swap index to get cheap unfunded exposure.
- *Currency component:* for each country within our benchmark, we use an index that replicates the performance of investing in a one-month synthetic local money market deposit, namely the Barclays GEMS single-currency USD Excess Return indices[9]. We exclude a country whose currency either has limited liquidity or is non-tradable, ie, Croatia, Egypt and Peru, and rescale the benchmark weights on each remaining country such that the sum of weights equal 100%. The following countries are used:
  - **Latam:** Argentina, Brazil, Chile, Colombia and Mexico
  - **EEMEA:** Czech Republic, Hungary, Israel, Turkey, Poland, Russia and South Africa
  - **Asia:** Indonesia, South Korea, Malaysia, Philippines and Thailand

We construct the synthetic replication of our benchmark by combining the duration and currency components with 100% exposure to each, where the exposure to the currency component is split among the countries included in the benchmark according to the methodology described above. The duration and currency components are rebalanced on a monthly basis.

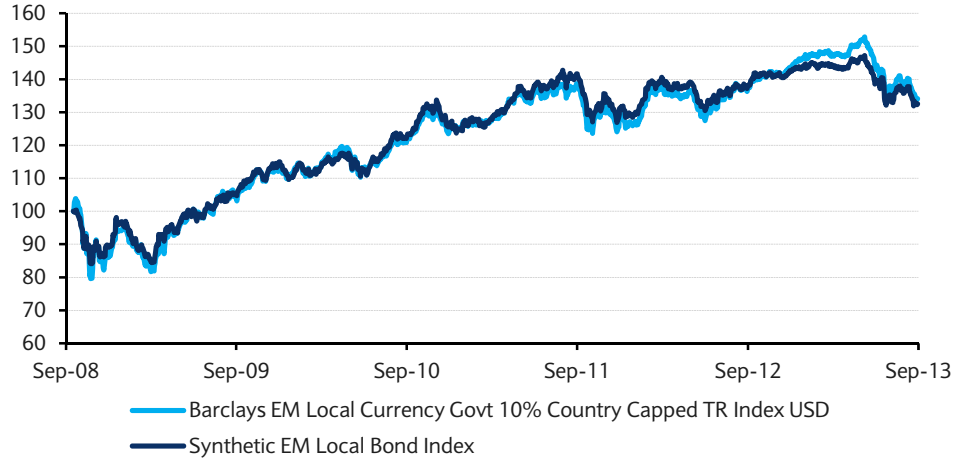
A more advanced methodology would be to dynamically adjust the duration component exposure to match the duration of our benchmark (a further advanced methodology would be to employ multiple interest rate swaps at various tenors to match the key-rate durations of our benchmark). As our chosen duration component, ie, the USD 5y receiver nominal interest rate swaps, has comparable duration to our EM local debt benchmark, adding this extra layer would only marginally improve the results to the detriment of added complexity. We therefore choose in this paper to adopt a simpler approach of allocating 100% static exposure to the relevant duration component.

As highlighted in Figures 3 and 4, this relatively simple approach, which only considers the duration and currency factors, produces a reasonable replication of our chosen EM local-currency benchmark. To be consistent with the chosen benchmark we begin our analysis in September 2008. While this is a relatively short time frame, it allows for the results to reflect a tradable history. The replicator tracks the benchmarks well over the sample period, with an average annualised tracking error of -43bp and a correlation of 96%. The slope coefficient of the replicator (0.91) in Figure 4 shows the attractive property that volatility targeting the synthetic index is not required to achieve a similar volatility profile as the benchmark.

[8] The Barclays USDFix 5y Nominal Swap Total Return Index is available on Bloomberg: BSWRTU05
[9] The GEMS indices area constructed by rolling 1-month FX forwards which are always short the US dollar versus the relevant emerging market currency.

FIGURE 2

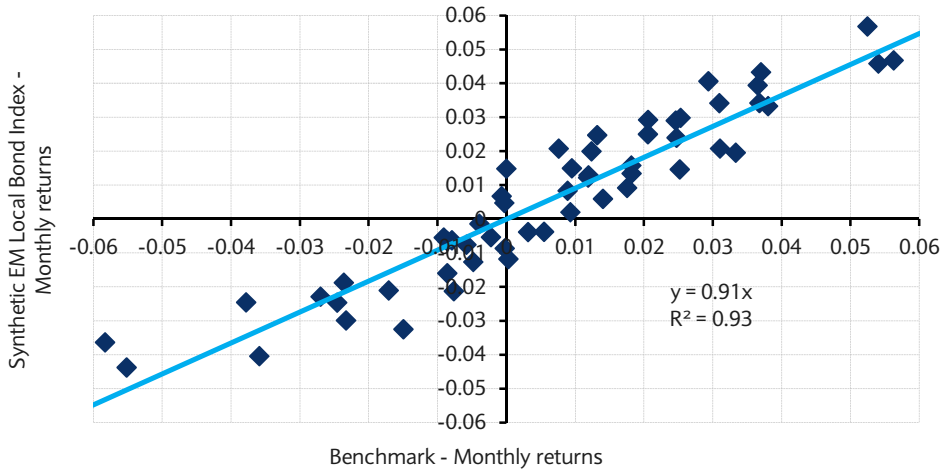
Synthetic replication with the rates and currency components



Source: Barclays Research

FIGURE 3

Synthetic replication with the rates and currency components



Monthly stats	Synthetic EM Local Bond Index vs the benchmark
Correlation	96.3%
Average Tracking Error (annualised)	-0.43%
Tracking Error Volatility (annualised)	3.07%

Source: Barclays Research

Synthetic replication – introducing credit risk

To further refine our synthetic replication, we now introduce the credit factor to our synthetic replication methodology. One approach of accessing pure credit risk is through Credit Default Swap (CDS) instruments. EM sovereign CDS have hard-currency EM bonds as reference obligations. These bonds provide exposure to a default risk premium since EM countries cannot inflate away their external debt. Single-name EM sovereign CDS have poor liquidity; hence, matching the allocation to each country within the benchmark (as we did for the currency components) is difficult. An alternative is using a tradable proxy for EM sovereign credit risk provided by the Barclays Sovereign Emerging Markets 5Y USD Excess

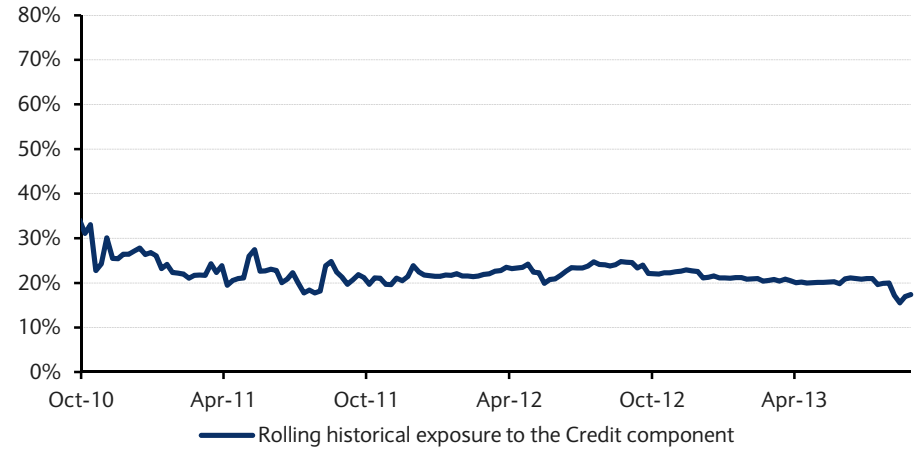
Return Index. This index replicates a rolling long-credit position[10] on the on-the-run series of the Markit CDX EM CDS index. The Markit CDX EM Index comprises around 15 sovereign CDS from Latam, EEMEA and Asia.

To assess the historical significance of the credit factor, we compute rolling regressions (using a two-year window) of the weekly returns of our benchmark minus the weekly returns of the duration and currency components (response variable) versus the weekly returns of the Barclays Sovereign Emerging Markets 5Y USD Excess Return Index (explanatory variable). Figure 5 reveals the historical rolling contribution of the credit premium (which is simply the slope of the regression assuming zero intercept) has been stable at approximately 20%.

Based on this study, we add a static exposure to the Barclays Sovereign Emerging Markets 5Y USD Excess Return Index[11] to our synthetic replication. Figures 6 and 7 demonstrate an improvement to the tracking properties of our synthetic replication, both in terms of tracking error (average annualised tracking error improved from -43bp to 25bp) and correlation (correlation improved from 96.3% to 97.0%). The slope coefficient near to one reflects that a change in the level of our benchmark translates into a change of very similar magnitude in our replication index.

FIGURE 5

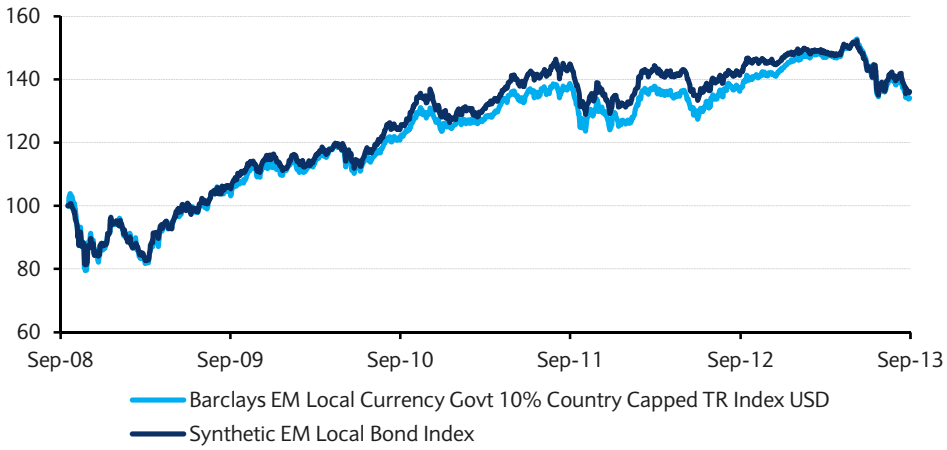
Historical rolling contribution of the credit premium to the total premium in EM local bonds



Source: Barclays Research

FIGURE 6

Synthetic replication with the rates, currency and credit components

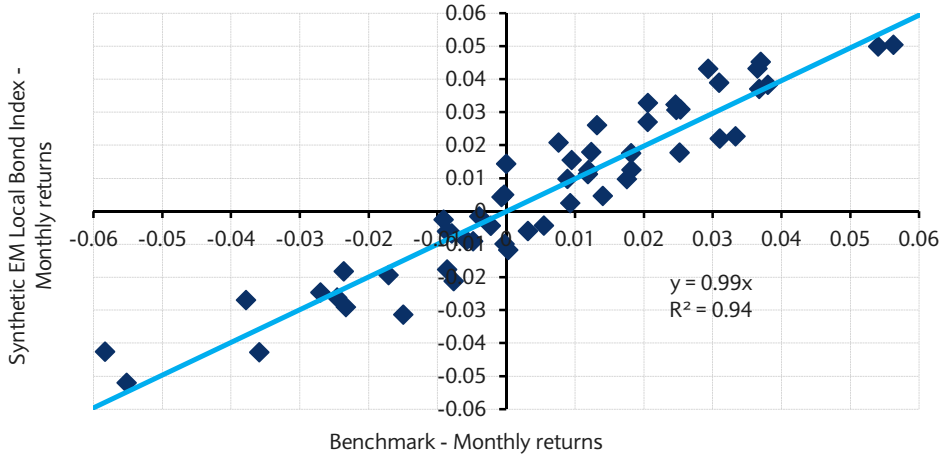


Source: Barclays Research

[10] selling protection
[11] which is our tradable proxy for the credit component

FIGURE 7

Synthetic replication with the rates, currency and credit components



Monthly stats	Synthetic EM Local Bond Index vs the benchmark
Correlation	97.0%
Average Tracking Error (annualised)	0.25%
Tracking Error Volatility (annualised)	2.83%

Source: Barclays Research

4. Synthetic replication of EM local inflation-linked debt

The previous section outlined a simple, transparent methodology for constructing an EM local nominal bond replicator. We extend the analysis to EM local currency inflation-linked bonds, using the *Emerging Markets Government Inflation-Linked bond (EMGILB) Index* as the reference benchmark. EMGILB includes government bonds denominated in local currency whose coupons and principal are linked to a domestic measure of inflation.

As in the case of local nominal debt, we segregate the returns from inflation-linked government bonds ('linkers') into multiple components: duration, currency, jurisdiction, credit and EM inflation. However, in contrast to the nominal debt case where all the main factors can be pinpointed, the EM inflation factor is harder to isolate. Rather than construct an ad-hoc measure to capture this, we make a more modest claim – the risk-return profile of the EM inflation-linked benchmark can be to some extent accessed by only using the duration, credit and currency factors. Future work will aim to extend this analysis to enhance the replication by adding this missing factor.

The main construction details of the chosen benchmark index are described below:[12]

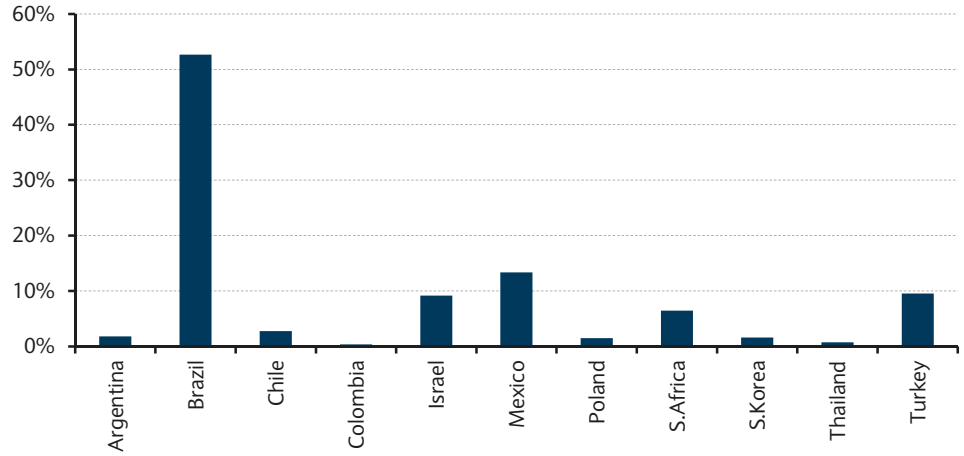
- *Country Inclusion:*
  - **Asia Pacific:** South Korea, Thailand
  - **EMEA:** Israel, Poland, South Africa, Turkey
  - **LATAM:** Argentina, Brazil, Chile, Colombia, Mexico
- *Weights*: Country exposure is determined using the market value weight of the country's index-eligible debt.

[12] The returns used for the analysis are USD unhedged. The EMGILB index is available on Bloomberg: BEMG0Z

- *Amount outstanding:* Minimum amounts outstanding are set in local currency terms and reviewed annually by Barclays, taking into account local market conditions, issuance trends and exchange rate movements.
- *Rebalancing*: Index composition is determined each month and is rebalanced on the last calendar day of each month.
- *Embedded costs:* none

The average historical modified duration of the benchmark index has been 7.2.[13] Figure 8 elucidates the average allocation (market value weights) to each country within the EMGILB (calculated over the past one year).

FIGURE 8
Average allocation (past one year) to each country within the EMGILB



Source: Barclays Research

Synthetic replication

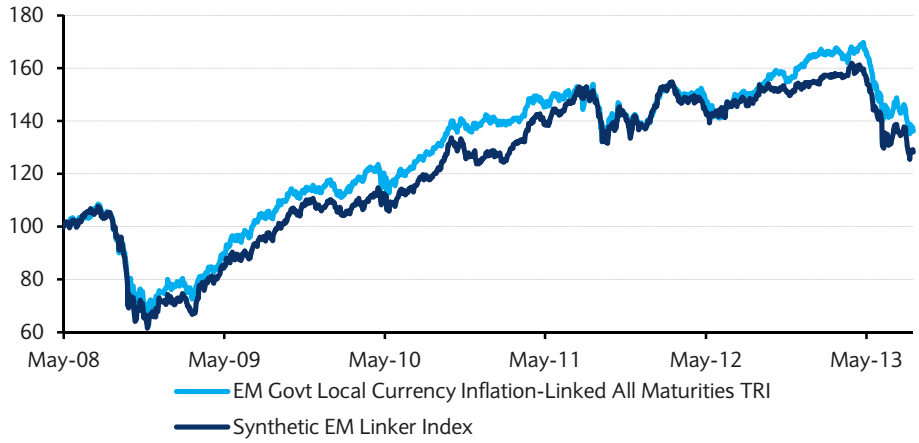
Synthetic replication of our EM local inflation-linked benchmark is carried out using the duration, currency and credit components – proxied by the Barclays US Government Inflation-Linked Bonds 7-10Y Index, the Barclays GEMS single-currency USD Excess Return indices and the Barclays Sovereign Emerging Markets 5Y USD Excess Return Index. The Barclays US Government Inflation-Linked Bonds 7-10Y Index[14] measures the total return of a pool of 7-10y US TIPS (Treasury Inflation Protected Securities) using market capitalisation weighting and is preferred over an all-maturities index since it gives us an average duration comparable to that of our chosen benchmark index. In the interest of simplicity, we maintain a small static exposure to credit in line with the analysis for local nominal bonds.

The results from the replication exercise are given in Figures 9 and 10. The correlation of monthly returns is 91%, which although lower than the nominal bond replication, is still attractive. The average annualised tracking error is -87bp. The summary statistics from the regression analysis provides further supporting evidence; the R-squared is 0.8 while the slope factor is close to 1.

[13] The range used to calculate the average duration was January 2010 to August 2013.
[14] The index is expressed in local returns. The Barclays US Government inflation-linked bond index can be found on Bloomberg: BCIT5T.

FIGURE 9

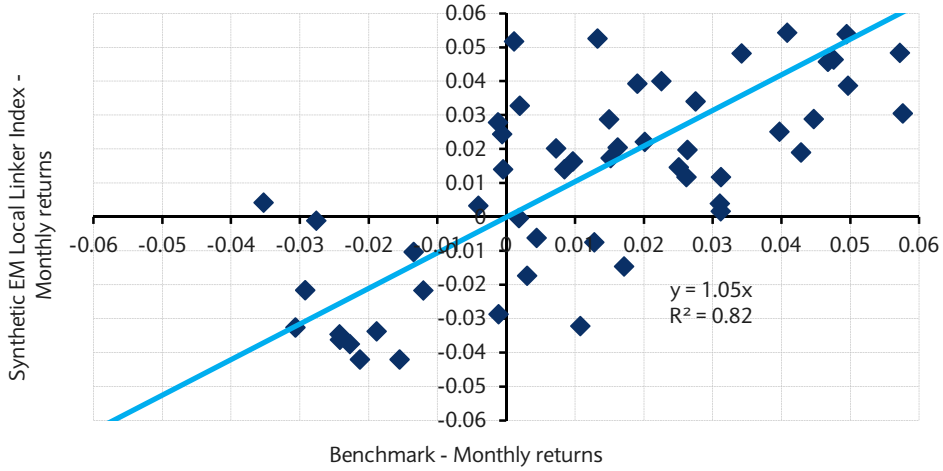
Synthetic replication with the rates, currency and credit components



Source: Barclays Research

FIGURE 10

Synthetic replication with the rates, currency and credit components



Monthly stats	Synthetic EM Local Linker Index vs the benchmark
Correlation	90.6%
Average Tracking Error (annualised)	-0.87%
Tracking Error Volatility (annualised)	7.54%

Source: Barclays Research

Implementation tip

The synthetic replication gives investors a chance to access the return profile of EM fixed income investments in unfunded format. To access EM local-currency linkers in synthetic unfunded format, US TIPS total return indices can be replaced by a combination of a receiver nominal interest rate swap index and a receiver inflation-linked swap index, both with the same duration as the US TIPS index.

5. Synthetic replication of single-country local currency debt

The growing investor appetite for the emerging market indices also extends to single-country bonds. Investors can take on country exposure through two approaches – investing in a single country bond index or investing in a particular bond issue. Referring to each of these cases, we show synthetic replication has the potential to provide foreign investors with access to certain EM local bond markets where direct exposure is complex or costly to acquire. Furthermore, investors can use the replication methodology to gain access in unfunded format.

Single-country bond investing

Local currency bond index returns are susceptible to multiple structural risk factors which include capital controls, mutable tax regimes, as well as less explicit barriers increasing investment costs and risks. Capital controls is probably the most explicit obstacle since it directly limits foreign investors' market access to local assets. It is most often associated with Asian markets, for instance China, where only Qualified Foreign Institutional Investors (QFII), who have to comply with stringent rules, can buy local bonds. Nearly 10 years after the launch of the QFII program in 2002, just 103 institutions were licensed QFII investors with a combined quota of US $30bn (representing only 0.8% of total market capitalisation). More recently, in April 2012, the combined quota was increased to US $80bn. Similarly, foreign investors looking to access the Indian local government bond market require authorisation from the securities and exchange board of India and, once authorisation is granted, the investor is subsequently allocated a quota.

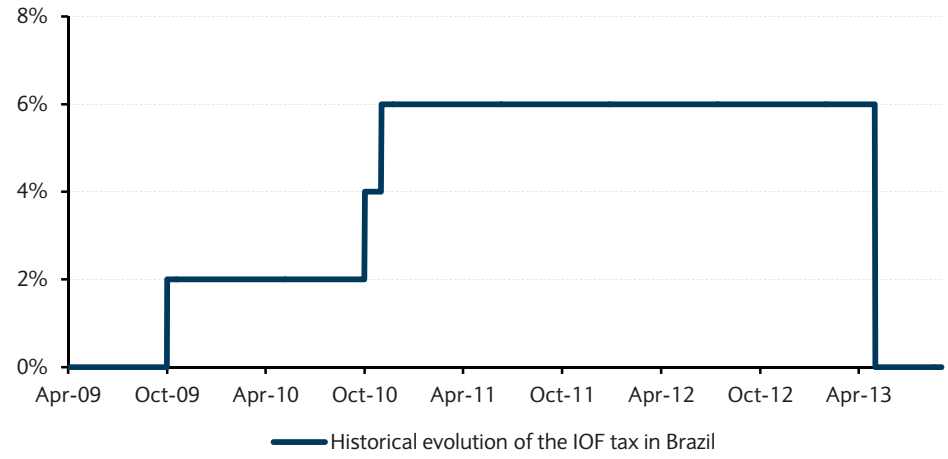
Prohibitive and mutable taxation is the other common form of explicit barriers to entry faced by foreign investors in local markets, as they are designed with the objective of penalising and hence deterring foreign inflows into local markets. Taxation is often very complex and may take the form of either an upfront levy or alternatively a withholding tax applied on income receive (both coupon and principal). The most classic example of the upfront levy is the IOF tax in Brazil, which was up to June 2013 at 6%, which means that investors buying BRL government bonds faced an immediate 6% haircut; hence, causing serious impediments to portfolio managers. The IOF tax on foreign fixed income flows has been recently reduced to 0%, but Brazilian Finance Minister Mr Mantega mentioned that if capital flows flood Brazilian FX markets, the government could always lift the IOF tax again, which would immediately hurt foreign investors in Brazilian local debt markets by devaluating their investment.

Additional obstacles include the scarcity of hedging instruments (currency and interest rate derivatives), as hedging instruments make it possible to reduce performance volatility. There are also factors increasing investment costs and risks, for instance, market infrastructure (such as the disclosure framework and price transparency), creditor protection, clearing and settlement systems (such as the necessity to appoint a local custodian account for the settlement) and the language barrier, which makes it difficult for foreign investors to find accurate and timely regulatory information and costly for them to fulfil documentation requirements. These complexities tend to be most prevalent in Asian local bond markets.

Replicating the Brazilian local bond index

In order to manage the flow of international capital into Brazil, foreign capital invested in Brazilian market instruments incurred between October 2009 and June 2013 a tax, payable on the exchange between foreign currency and Brazilian Real. This is effectively a transaction tax that acts as a deterrent for foreign investors, including those seeking exposure to Brazilian local currency bonds. Figure 11 shows the historical evolution of the IOF tax in Brazil.

FIGURE 11
Historical evolution of the IOF tax in Brazil

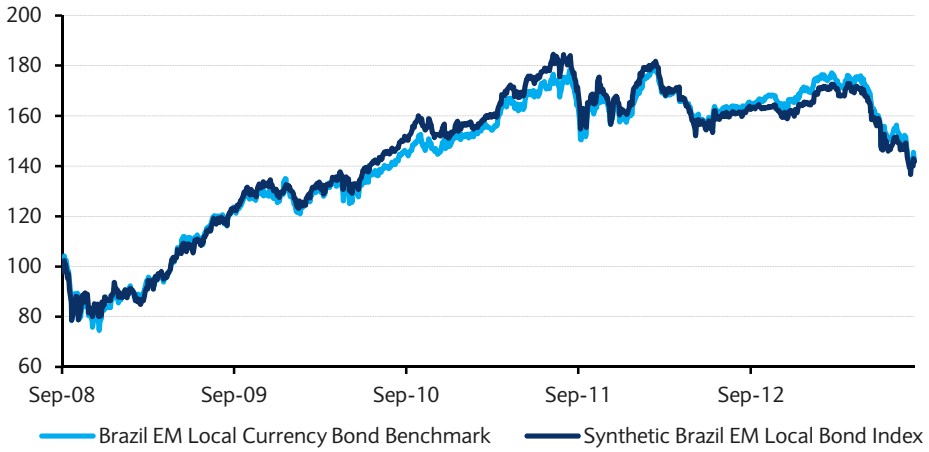


Source: Barclays Research

We use the replication methodology to model the returns of the *Barclays EM Local Currency Government: Brazil Index*[15]. Using the same tradable building blocks for the duration and currency components as in Section 3, and using an index that replicates a rolling long-credit position (ie, selling protection) on Brazilian 5y sovereign credit default swaps for the credit component, we obtain the synthetic replication as shown in Figures 12 and 13.

The full-sample replication results are good, with an average annualised tracking error of -14bp and a correlation of 94%. It is particularly interesting to note that the synthetic index replicates not only the pattern of returns but also the magnitude (referring to the slope of the regression), providing investors with an accurate return profile without requiring the assistance of any form of volatility targeting.

FIGURE 12
Synthetic replication with the rates, currency and credit components

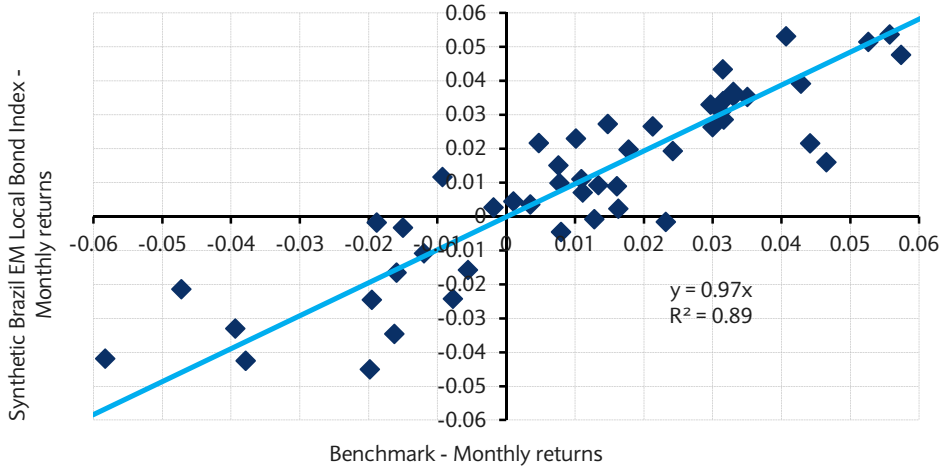


Source: Barclays Research

[15] Returns are USD unhedged. The Barclays EM Local Currency Brazil Index is available on Bloomberg: LCEBTRUU

FIGURE 13

Synthetic replication with the rates, currency and credit components



Monthly stats	Synthetic EM Local Bond Index vs the benchmark
Correlation	94.4%
Average Tracking Error (annualised)	-0.14%
Tracking Error Volatility (annualised)	4.72%

Source: Barclays Research

Single bond investing

Another area where the synthetic replication methodology can add value is when taking exposure to individual points on the local yield curve. This is the most granular investment proposition discussed so far. We started with a broad-based global EM index, developed the analysis to a country-specific index and now extend the study to country-specific, single-bond issues. There can be a significant discrepancy in liquidity (and hence cost) for bond issues both along the curve and between countries. This typically has the effect of either concentrating investors on certain points of the local curve (potentially causing pricing distortions) or incentivising them to purchase the equivalent global bonds.

Global bonds are issued as a means for foreign investors to access the local universe without the complexities and constraints associated with local yield curve investing. Global bonds are instruments that are denominated in the local currency, but typically pay coupon and principal in USD. In general, global bonds are not subject to local taxes and can be settled through a global custodian. However, since they are local-currency denominated, the investor is able to benefit from the local EM risk premia and thus potential elevated returns relative to hard currency bonds. As with most things in finance, there is rarely a free lunch and this case in no exception. While global bonds benefit from better accessibility relative to their local peers, investors do tend to pay a premium which is exacerbated by the fact that foreign demand is concentrated in only a small number of bonds. Using the case of Russian global bonds, we highlight this premium paid by global bond investors and the implicit tail risk that is driven by regulatory change. The tail risk refers to the fall in price as changes in regulation make local bonds more widely accessible to foreign investors. Replicating single bonds can be viewed as circumventing this convergence risk associated with global bonds and allows investors access at any tenor without being exposed to the global bond premium.

Replicating a Russian single-bond index

As we explained previously, Russia has issued global bonds to give easier access to foreign investors to its local debt market. Such accessibility relative to its local peers comes with a premium which we can measure by comparing a Russian global bond with a Russian local bond of comparable maturity:

- *Russian local bond (OFZ)*: issued in March 2011 with 7y maturity and 7.5% coupon (ISIN: RU000A0JRCJ6)
- *Russian global bond*: issued in February 2011 with 7y maturity and 7.85% coupon (ISIN XS0564087541)

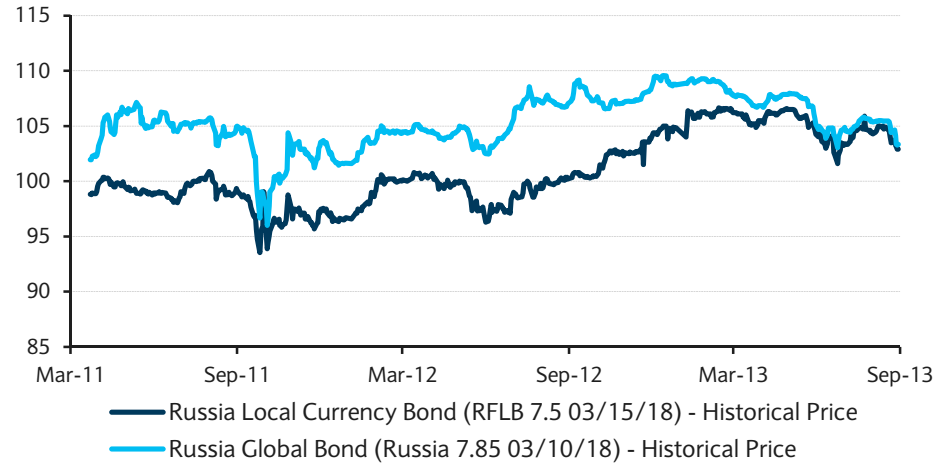
The two key observations from information in Figure 14 are: investors would have paid historically a premium of around 4.5% relative to local debt to access these global bonds; and this premium rapidly declined from Dec 2012 onwards.

The persistent premium can be explained by the complexity for investors to access Russian local-currency bonds without a local presence, especially the cumbersome administrative requirements and the absence of global settlement facilities. The result has been for foreign investors to take on local access via single global bonds.

The narrowing of the premium between global and local bonds coincides with the liberalisation of the local curve by Russian authorities, which removed the barriers to market entry that foreign investors had previously faced. The liberalisation process, though a long-term positive for foreign investors, has adversely affected existing global bonds which have faced strong selling pressure; the resulting policy shift has made all points of the curve significantly more accessible, thereby removing the inherent benefit of holding global bonds versus genuine local instruments. Since the start of the liberalisation process, the premium and benefit of holding single global bonds on the local Russian curve has largely evaporated. Global bond holders of other countries' debt face the same regulatory-based source of tail risk.

FIGURE 14

Historical price comparison of Russian local versus Global Bonds



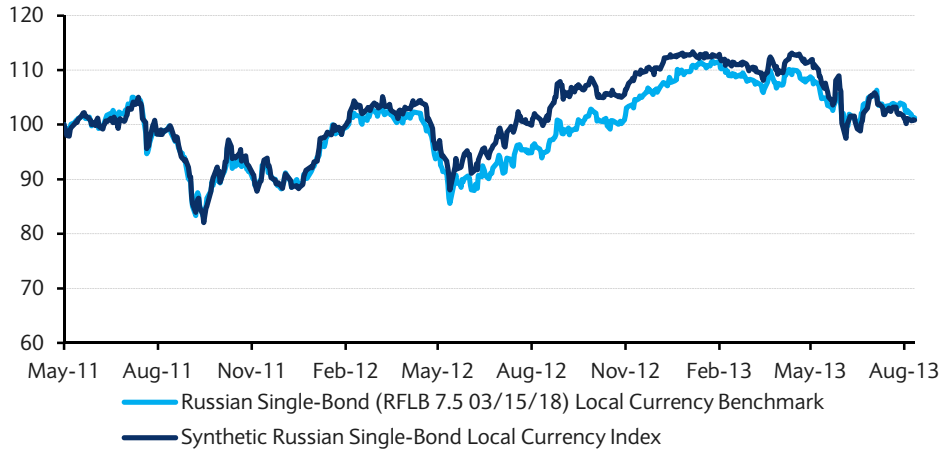
Source: Barclays Research

Synthetic replication has in such cases obvious advantages as it gives investors access at any tenor without being exposed to the global bond premium and without the risks associated with a potential change in local policy that may affect the economic benefits of the global bonds, in particular the liberalisation of the local curve.

We employ the synthetic replication methodology described previously in this article and use it to replicate the above Russian local bond. Using the same tradable building blocks for the duration and currency components as in Section 3, and using an index that replicates a rolling long-credit position (ie, selling protection) on Russian 5y sovereign credit default swaps for the credit component, we obtain the synthetic replication as shown in Figures 15 and 16. Monthly returns are highly correlated (0.92) with an average annualised tracking error of -92bp.

FIGURE 15

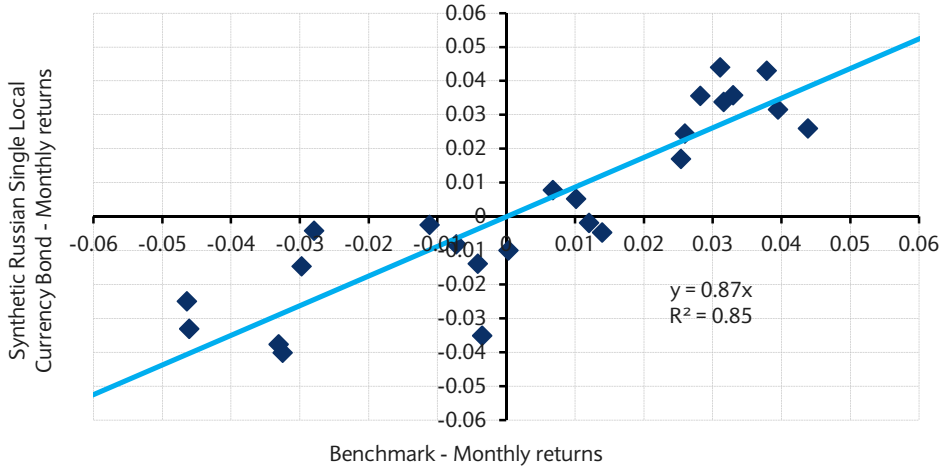
Synthetic replication with the rates, currency and credit components



Source: Barclays Research

FIGURE 16

Synthetic replication with the rates, currency and credit components



Monthly stats	Synthetic EM Local Bond Index vs the benchmark
Correlation	92.3%
Average Tracking Error (annualised)	-0.92%
Tracking Error Volatility (annualised)	4.74%

Source: Barclays Research

Concluding remarks

We explored the risk premium embedded in local currency debt, decomposed this premium into multiple components and highlighted the role of each component in explaining total EM local debt returns. To a large extent, EM local debt investment can be synthetically replicated using developed market (duration equivalent) positions and an FX component which can be accessed through separate tradable building blocks. Additionally, overlaying a credit component helps improve the replication. We showed examples of this synthetic replication approach on specific countries where direct exposure to the local currency bonds would be complex or costly. Synthetic replication provides access to certain local debt markets where global bonds are the only efficient means of market access for foreign investors, but typically attract a premium to compensate for the enhanced accessibility and are subject to local policy changes which may alter the economic profile of the holding significantly. Barclays' investable indices provide all the necessary building blocks for the investment approaches we propose in this article.

References

[1] Ghia, Kartik, Staal, Arne, Harman, Scott, "It's almost all in the currency exposure" *(November 2011)*

[2] Ghia, Kartik, Staal, Arne, Rennison, Graham, "The EM FX carry premium" *(September 2010)*

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