

MAY 2015

Danske Capital

Inflation-linked bonds from emerging markets provide attractive yield opportunities

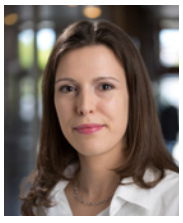
Risk diversification and opportunities for an attractive yield compared to nominal bonds constitute the key rationale for investing in emerging markets inflation-linked bonds.

KEY CONCEPTS

- Protection against global inflation in an environment of expansionary monetary policies
- Expected annual return of around 7.0% before costs
- Opportunity to benefit from both increasing inflation and appreciating currencies
- Higher risk-adjusted return than on emerging markets equities



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Inflation-linked bonds from emerging markets provide an attractive risk profile

EXECUTIVE SUMMARY

Inflation-linked bonds – or "linkers" – from emerging market countries have some attractive features for investors looking for both diversification and a high return. Most importantly, they offer protection against inflation, which tends to be significantly higher within emerging markets than within developed markets. This is exactly where linkers differ from nominal bonds.

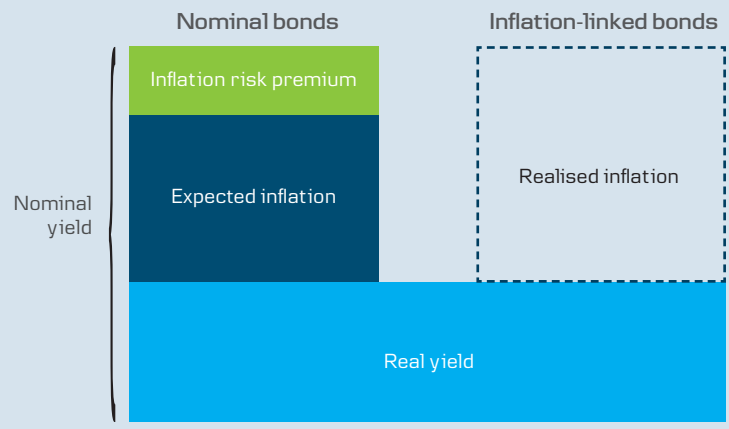
The relatively low correlation with developed markets bonds also offers investors a stabilising element into their balanced portfolio. The correlation ratio against global government bonds is only 0.45. It is also worth noting that over the past 11 years, where we have solid data available, the total annual return on emerging markets linkers has been higher than the return on emerging market nominal bonds. Both bond types have provided significantly higher risk-adjusted returns than emerging markets equities.

How inflation-linked bonds work

The first inflation-linked bonds were issued at the beginning of the 1960s by Brazil. At that time, Brazil was a perfect example of a country with a weak currency and persistently high inflation - something that worried nominal bond investors who demanded higher rates as a compensation for taking on the risk of inflation. In an effort to obtain funding at reasonable rates and rebuild investor confidence in the effectiveness of their anti-inflation fiscal policies, the government started issuing inflation-linked bonds.

CHART 1: Yield components

Investors in nominal bonds are paid for the inflation risk through the nominal yield, which is significantly higher than the coupon rate on inflation-linked bonds. The reason for this is that the inflation-linked bond investor will be compensated for inflation via an annual revaluation of the principal to offset inflation.



Inflation-linked bonds from emerging markets provide an attractive risk profile



With a market value of more than USD 200 billion, Brazil is the largest issuer of emerging markets inflation-linked bonds. According to Barclays, the total linker market is currently worth more than USD 2,800 billion (January 2015) of which emerging markets account for around 20%.

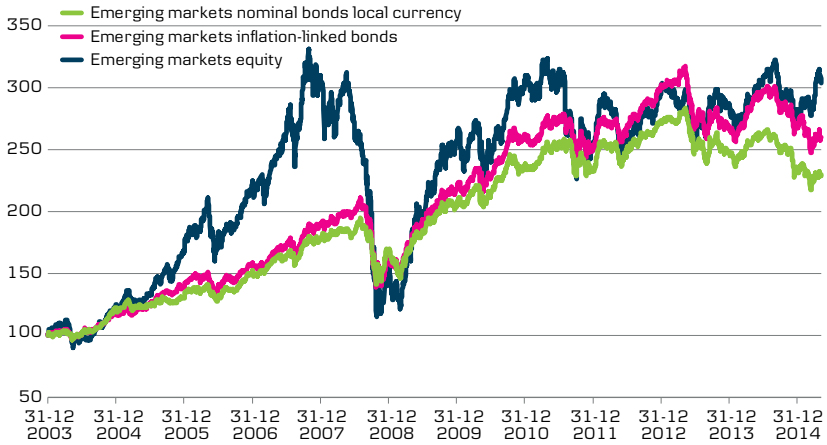
The main principle underlying an inflation-linked bond is to protect the investor from fluctuations in inflation. While the methodology may differ from country to country, the concept is to measure inflation and adjust the principal value so that it reflects local inflation. If inflation is 10%, the principal value will be adjusted by 10%, typically with a lag of two or three months.

Although the coupon rate does not change, the investor will receive a higher interest as the interest is calculated on the basis of a new and adjusted principal value.

Investors in nominal bonds are paid for the inflation risk through the nominal yield, which is significantly higher than the nominal coupon rate on inflation-linked bonds. Thus, inflation-linked bond investors are betting on a higher inflation rate than nominal bond investors. If inflation comes out lower than expected, the nominal bond investor will benefit through rising bond prices, while the inflation-linked bond investor will experience a loss on his investment.

CHART 2: Relationship over time between returns on three emerging market asset classes

The graph shows that emerging market equity investments are risky during a major crisis. In contrast, emerging markets inflation-linked bonds exhibit much less fluctuation. Compared to emerging markets nominal bonds, the linkers have provided higher returns, even though the correlation between the linkers and the nominal bonds is very high.



SOURCE: Index from Bloomberg in USD (no hedging) for the period from the beginning of 2004 to 7th May 2015. Calculations are performed by Danske Capital. The inflation-linked bond index derives from Barclays EMGIL constrained, which is ex Argentina and Colombia. The emerging markets nominal bonds local currency index derives from JPMorgan GBI-EM Global Diversified. The emerging markets equity index derives from MSCI Daily Total Return Net Emerging Markets. Past performance is not an indication of future results.

Three sources of return

Linker investors have three sources of return. A large proportion of the return stems from the annual revaluation of the principal, which is continuously increased to offset inflation. The second source of return



As the historical data only goes back around 11 years, we have not yet experienced how emerging market inflation-linked bonds will perform during periods characterised by extreme inflation or deflation fears in emerging markets like Turkey, Brazil and Mexico.

stems from the real interest rate, which averages 3% for emerging markets. The final source of return stems from the potential for currency appreciation, which can make a significant contribution to the total return.

TABLE 1: Return and volatility of emerging market linkers compared to other asset classes

The table shows the volatility and annual return on different asset classes. Both emerging markets nominal bonds and inflation-linked bonds have provided significantly higher risk-adjusted returns than emerging markets equities. Note that due to changes in hard currency exchange rates, volatility, return and performance during the crisis would look differently in e.g. EUR.

	Annual return 2004-2015	Volatility YoY on a daily basis
Emerging markets equities	10.3%	29.6
Emerging markets inflation-linked bonds	**8.8%**	**14.0**
Emerging markets nominal bonds (local currency)	7.6%	12.0
Global equities	7.0%	18.6
Global inflation-linked bonds (developed markets)	4.9%	7.3
Global investment grade bonds	4.5%	7.4
US government bonds	4.3%	3.9

SOURCE: Index from Bloomberg in USD (no hedging) for the period from the beginning of 2004 to 7th May 2015. Calculations performed by Danske Bank. Volatility is calculated as a standard deviation y/y on a daily basis. The inflation-linked bond index derives from Barclays EMGILB constrained, which is ex Argentina and Colombia. Past performance is not an indication of future results.

According to the Purchasing Power Parity Hypothesis, higher inflation should result in a weaker currency over time. Within emerging markets, inflation is relatively high, so currencies are likely to depreciate over time. However, we should also take note of the Balassa-Samuelson effect, which states that countries with higher productivity growth also experience high wage growth, leading to higher inflation and higher real exchange rates.

Of course you could also consider FX-hedging, but the costs involved would swallow up too much of the return. The reason for this is that FX-markets only price in depreciation from higher inflation but not the opportunities for appreciation originating from expected increases in productivity. The cost of not hedging is higher volatility in the short run, but in the long run it can create significant value. Currently, the neutral expected return on an investment in emerging markets inflation-linked bonds is around 7.0% p.a.

TABLE 2: Inflation-linked bonds versus nominal bonds

Emerging markets linkers will gain regardsless whether improvements within individual countries will be reflected in a stronger currency or higher inflation. Moreover, they are not dependent on central banks' capabilities to control inflation.

General hypotheses around emerging markets	Emerging markets inflation-linked bonds	Emerging markets nominal bonds (local currency)
Purchasing Power Parity: Higher inflation and weaker currency	Neutral	Negative
Balassa-Samuelson effect: Improved competitiveness leads to a stronger currency	Positive	Positive

TABLE 3: Portfolio diversification

Emerging markets inflation-linked bonds provide almost the same diversification in a portfolio as emerging markets nominal bonds do. The relatively low correlation with bonds from developed markets adds a stabilising element to investors' balanced portfolios.

Correlations between different asset classes	Emerging markets inflation-linked bonds	Emerging markets nominal bonds (local currency)
Emerging markets equities	0.83	0.81
Emerging markets nominal bonds (local currency)	0.93	1.00
Global corporate bonds IG	0.47	0.56
Global government bonds	0.45	0.53
Global equities	0.73	0.71
Global inflation-linked bonds (developed markets)	0.46	0.53

SOURCE: Bloomberg and Danske Capital, calculations on a weekly basis, from the beginning of 2004 to 7th May 2015, assets in USD

Emerging markets inflation tends to be higher than target

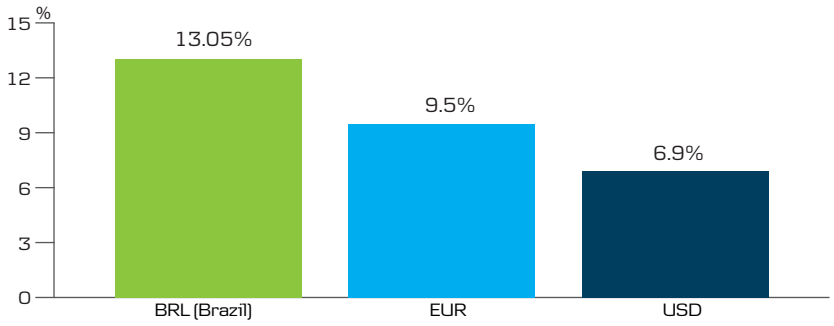
The history of inflation shows that many developing countries have difficulties controlling both fiscal policies and inflation. Of course, governments have a strong incentive to keep inflation low, since higher inflation implies higher costs in the form of interest on inflation-linked

bonds. But despite the economic incentives, some emerging market governments still have problems controlling inflation. Brazil, which is the biggest issuer of linkers among emerging market countries, stands out with an actual inflation rate of 8% and a government target of 4.5%.

With inflation hovering around 8% in Brazil investors can expect a relatively high nominal return. But of course nothing is free. With modest growth rates, high inflation tends to funnel into currency depreciation, which is precisely the case for Brazil. Measured against the USD, the Brazilian real (BRL) weakened by around 33% from end-2007 to end-2014. Against the euro (EUR) the BRL weakened by 20%, which creates significant differences in return, depending on whether investors are USD or EUR based.

CHART 3: Falling exchange rates' impact on total returns

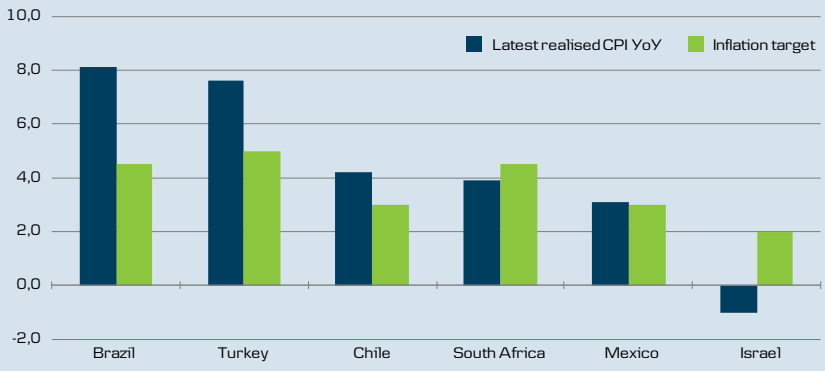
Annual return from Brazilian inflation-linked bonds, adjusted for currency fluctuations, 2008-2014. A Brazilian investor would have received an annual return of 13.05%. Because of the appreciation of the US dollar, the annual return for an American investor would have been just 6.9%, while a euro investor would have received 9.5%.



SOURCE: Danish Central Bank, OECD and Brazilian Federal Public Debt, Calculations by Danske Capital. Past performance is not an indication of future results. NOTE: The calculation is based on an inflation-linked bond with a maturity of nine years issued January 9, 2008 by the Brazilian Government with a yield quoted at 7.3%. In January 2015 an 8-year Brazilian inflation-linked bond was issued with an average yield quoted at 5.93% – plus inflation.

CHART 4: Governments tend to underestimate inflation

The bar chart shows the difference between the latest recorded inflation rate and the country's inflation target. Note that South Africa and Israel do not operate with a fixed inflation target, but instead they have set an inflation range. For these two countries we have used a mean value based on the countries' inflation range.



SOURCE: Bloomberg, April 2015

Nature of risks

Investors in emerging markets bonds face several risks that are reflected in higher returns and higher volatility. The most important risks are the interest rate risk, currency risk and credit risk. The local currency risk is significant, and it is also very important to understand the interest rate sensitivity of inflation-linked bonds.

When yields rise, bond prices fall, triggering a loss for the bond portfolio. A bond's sensitivity to changes in interest rates is measured by its duration. The duration of a nominal bond can be broken down into two components: Sensitivity to changes in real interest rates and sensitivity to changes in expected inflation, as higher inflation is usually followed by higher interest rates. Roughly, the long-term average shows that if the nominal rate goes up 1%, the real rate goes up 0.5% and expected inflation goes up 0.5%. Therefore, the nominal duration of an inflation-linked bond is half of the real duration.

TABLE 4: Duration for linkers versus nominal bonds

The table shows that Real Duration for a linker is reduced from 8.2 to a Nominal Duration of 4.1 when you take the inflation element into account. The explanation is that while the price of a nominal bond drops as interest rates rise, a linker investor will be fully or partially compensated through the inflation allowance. The linker investor will only experience a fall in the value of his investment, if real interest rates rise.

	Emerging markets inflation-linked bonds	Emerging markets nominal bonds (local currency)
Real Duration	8.2	-
Nominal Duration	4.1	4.8
Yield to maturity	2.9	6.4
Rating	Baa1/A3	Baa2/BBB+/BBB+

SOURCE: Danske Capital, April 2015

CONCLUSION

Emerging markets inflation-linked bonds have some unique characteristics that provide attractive expected returns and diversification to investors' total portfolio while protecting the investment from the detrimental effects of inflation. As long as the investment is protected against local inflation, the greatest risk is fluctuations in local currencies against the investor's own currency. However, the local currency also represents an additional upside, if the country is doing well and is becoming more competitive.