

INDEX

METHODOLOGY

AFMI Bloomberg African Bond Family of Indices

Bloomberg
INDEXES



TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION	3
CHAPTER 2. OVERVIEW OF THE AFMI BLOOMBERG AFRICAN BOND INDICES.....	5
CHAPTER 3. INDEX RULES	7
CHAPTER 4. ACCESS TO AFMI BLOOMBERG AFRICAN BOND INDEX FAMILY.....	15
CHAPTER 5. APPENDICES	17
Appendix A: Index Base Dates	17
Appendix B: AFMI Bloomberg African Bond Index Methodology	18
Appendix C: Risk Parameters	20



THE AFMI Bloomberg African Bond Indices

Chapter 1. Introduction to the AFMI Bloomberg African Bond Index Family

In December 2014 the African Development Bank (AfDB) through the African Financial Markets Initiative (AFMI) and Bloomberg officially launched the AFMI Bloomberg African Bond Indices (ABABI). The ABABI will provide investors with a reliable tool with which to measure and track the performance of Africa's bond markets. These bond indices will pave the way for the African Domestic Bond Fund which is one of the three pillars of the African Financial Markets Initiative.

The ABABI indices are composite indices of single-country local-currency sovereign Bloomberg indices. At inception the indices included bonds from Egypt, Kenya, Nigeria, and South Africa. In October 2015 Botswana and Namibia were added and in April 2017 Ghana and Zambia were added. The family of indices include:

AFMI Bloomberg African Bond Index (ticker: BADB), a US dollar based market capitalization weighted composite index.

AFMI Bloomberg African Bond Index 25% Capped (ticker BADBC), is a version of the AFMI Bloomberg African Bond Index where country contribution is capped. Countries that exceed 25% of the market value of the uncapped Index are limited to 25%. The excess market value of the 25% cap is redistributed on a pro rata basis to all other countries that are under the 25% cap. This process is repeated until no country exceeds the 25% limit.

AFMI Bloomberg African Bond Index ex South Africa (ticker BADBx), is a version of the AFMI Bloomberg African Bond Index that excludes South Africa.

Each index has maturity bucket sub-indices of 1 to 3, 1 to 10, and greater than 10 years.

The African Development Bank and Bloomberg will periodically review countries for inclusion or removal from the index to ensure representativeness. Investors use indices to measure the performance and risk profile of a market. A balance is necessary between investability and completeness when determining index membership. Bloomberg's indices have been designed to include bonds with sufficient liquidity, reliable pricing and complete and easily monitored terms and conditions.

Independence is the bedrock of Bloomberg's bond index family. In contrast to most other index families where selection and pricing are done by a single dealer or where a single dealer uses a small number of contributors to arrive at a composite price, the composition of each Bloomberg index is independently selected and priced. Index constituents are priced by BVAL, Bloomberg's securities valuation service, which draws on market data sourced from multiple market participants.



Chapter 1. Introduction to the AFMI Bloomberg African Bond Index Family (continued)

The suite of AFMI Bloomberg African Bond Indices and Bloomberg Local Sovereign Indices, provide investors with an objective measure of Africa’s local sovereign debt markets. The chart below shows the primary indices that make up the ABABI Family and their corresponding tickers in the Bloomberg Professional® service.

AFMI Bloomberg African Bond Index Family			
Bloomberg Primary Indices	African Bond	African Bond 25% Capped	African Bond ex S. Africa
Egypt Local Sovereign BEGYP	1+ Year BADB	1+ Year BADBC	1+ Year BADBX
Kenya Local Sovereign BKEN	1 to 3 Year BADB13	1 to 3 Year BADBC13	1 to 3 Year BADBX13
Nigeria Local Sovereign BNGRI	1 to 10 Year BADB110	1 to 10 Year BADBC110	1 to 10 Year BADBX110
South Africa Local Sovereign BNGRI	10+ Year BADB10	10+ Year BADBC10	10+ Year BADBX10
Botswana Local Sovereign BBOTS			
Namibia Local Sovereign BNAMI			
Ghana Local Sovereign BGHA			
Zambia Local Sovereign BZMB			



Chapter 2. Overview of the AFMI Bloomberg African Bond Index Family (continued)

The AFMI Bloomberg African Bond Indices comply with international conventions for index construction. In particular:

- **Market coverage:** The universe of securities changes over time, and Bloomberg continually monitors new issuance and the potential inclusion into the Indices of eligible securities.
- **Replicability:** Each of the AFMI Bloomberg African Bond Indices is a practical index capable of replication in a real-world portfolio.
- **Transparency:** All criteria for index construction are publicly available, including the criteria for index membership, the rebalancing frequency and all data required for the computation of index returns and statistics.
- **Global standardization:** The calculation process for the AFMI Bloomberg African Bond Indices is consistent with international market best practices.
- **Data integrity:** Independent and transparent pricing is a key difference of Bloomberg's index family. Many other index families, rely on single-dealer pricing or composite pricing across a small number of dealers. Prices of index bonds in Bloomberg's indices are gathered from BVAL, Bloomberg's securities valuation services. BVAL provides credible, transparent and defensible valuations across a broad spectrum of financial instruments, including fixed income, derivatives and structured notes. These prices are completely independent, drawing on contributors relevant to the market. This broad global dataset of market observations is combined with analytics and Bloomberg's terms and conditions databases to produce objective third-party pricing with transparency into how the prices are derived.
- **Returns and Statistics:** Index levels and related portfolio characteristics reported on Bloomberg bond indices are drawn from two different versions of the index—the "Returns Universe" and the "Projected Universe."
 - **Returns Universe:** The returns universe is designed to mimic a strict buy-and-hold portfolio with a monthly rebalancing. The returns universe membership is defined by applying the security eligibility rules at each monthly rebalancing date and holding the resulting list of securities constant over the month. Starting weights for the constituents are based market values on the rebalancing date (save the capped indices). All published return measures are calculated against the returns universe and include corporate actions that occur during the month.
 - **Projected Universe:** The projected universe represents the changing risk profile of the market the index is designed to represent. The statistics universe membership is defined by applying the security eligibility rules daily and setting constituent weights based on daily closing prices. The statistics universe captures new issuance and removes securities that are no longer eligible. The statistics universe is used as a projection of the next rebalancing as the projected universe membership becomes the returns universe membership for the following month.



Chapter 3. Index Rules

SUMMARY INDEX RULES

Following is a summary of the rules that govern the AFMI Bloomberg African Bond Indices.

Sectors:	Sovereign
Currency:	Bonds are in local currency, indices are US dollar based
Minimum issue size:	To be included in the index a security must have a minimum par amount outstanding of ZAR 2 billion, EGP 1 billion, NGN 50 billion, KES 1 billion, BWP 500 million, NAD 500 million, GHS 100 million, or ZMW 50 million.
Coupon:	Fixed rate
Maturity:	Must have a maturity of greater than one year
Ratings:	There are no rating requirements
Reinvestment:	Daily, fully reinvested in the index
Pricing:	Daily BVAL (Bloomberg Valuation Service) New York 3PM
Bond types excluded:	<ul style="list-style-type: none"> Convertibles Zero coupon Private placements Perpetual Amortizing structures Credit-linked notes Total return structures Collateralized debt, bond and fund obligations (CDOs, CBOs, CFOs) Synthetic securitizations Hybrid capital securities



Chapter 4. Access to AFMI Bloomberg African Bond Index Family

Data and analytics

The AFMI Bloomberg African Bond Indices compiles returns and characteristics for 20 indices. All indices are calculated daily and results are available at the end of the day.

Bloomberg Professional[®] service

AFMI Bloomberg African Bond Indices are available for analysis in many functions on the Bloomberg Professional[®] service. Some of the functions available include:

- Comprehensive benchmark and portfolio analysis in PORT <GO>
 - Characteristics & exposures through time
 - Tracking error
 - Scenario analysis
 - Performance attribution
 - Projected cash flows
 - Optimization
 - What-if analysis
 - Intraday performance
- Detailed description pages with terms and conditions
- API for downloading data into Excel
- Single security calculators
- Relative value analytics
- BVAL prices and transparency screens



Chapter 5. Appendices

Appendix A: Index Base Dates

AFMI Bloomberg African Bond Index	07/06/2012
AFMI Bloomberg African Bond Index 25% Capped	07/06/2012
AFMI Bloomberg African Bond Index ex South Africa	07/06/2012
Bloomberg Egypt Local Sovereign Index	07/06/2012
Bloomberg Kenya Local Sovereign Index	07/06/2012
Bloomberg Nigeria Local Sovereign Index	07/06/2012
Bloomberg South Africa Local Sovereign Index	01/01/2010
Bloomberg Botswana Local Sovereign	10/03/2014
Bloomberg Namibia Local Sovereign	08/01/2014
Bloomberg Ghana Local Sovereign	12/30/2016
Bloomberg Zambia Local Sovereign	12/30/2016



Appendix B: AFMI Bloomberg African Bond Index Methodology

Revaluation

The AFMI Bloomberg African Bond Indices are capital accumulation indices, designed to measure the total return from investing in a particular sector. In the absence of any new issue, maturities, or other changes in the index portfolio, the accumulation index may be written as:

Table A: Index valuation formula

$$INDEX = \frac{\sum_{j=1}^n (P_{j,t} + C_{j,t}) F_{j,t}}{\sum_{j=1}^m P_{j,0} F_{j,0}}$$

- P_{j,t}** is the gross price per \$1.00 of face value for the j bond at time t, which includes an accrued interest component that increases linearly from the time that a coupon was last paid until the bond next turns ex-interest
- C_{j,t}** is the coupon payable per \$1.00 face value for the j bond if the date t falls in the time period from the ex-interest date to the interest payment date, discounted to reflect the fact that this coupon will not actually be received until the payment date
- F_{j,t}** is the face value on issue for the j bond at time t
- n** is the number of bonds in the index portfolio
- m** is the number of bonds in the index portfolio at inception

Daily Index Calculation

Bloomberg index returns and statistics are calculated every weekday. Adhering to the principle of incorporating the most accurate and recent data available, when a local holiday precludes employing same-day pricing, then the index will use the previous day's pricing but maintain same-day settlement.

Rebalancing

All indices are rebalanced monthly unless otherwise noted. The rebalancing day is the last business day of the month.

Reinvestment

Received coupon and principal are reinvested in the universe of securities comprising the index. Rebalancing is performed in market value proportions at the day's closing prices.



Appendix C: Risk Parameters

The following risk parameters are applied to the individual bonds comprising an index and the index as a whole.

Duration

Calculated as the weighted average term of all cash flows relating to a bond, including coupon receipts and maturity payment, using as weights the cash flows expressed as present values.

Modified Duration

Measures bond price sensitivity to interest rate changes. Modified duration is a linear approximation to price changes.

Convexity

Measures a bond's price / yield curve deviation from linearity. It explains the discrepancy between actual price changes and those predicted using modified duration alone. Thus, convexity measures the second derivative of price with respect to interest rates, and indicates how sensitive modified duration is to changes in interest rates.



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