

# FIRST SUPPLEMENT TO THE CA CISIS PROGRAMME MEMORANDUM



CLOUD ATLAS COLLECTIVE INVESTMENT  
SCHEME IN SECURITIES ("CA CISIS")

**FOR PRIVATE USE ONLY: This Supplement contains important information about CA CISIS and the AMI Big50 ex-SA Participatory Units and should be read carefully. If you have any questions about the content of the Programme Memorandum or this Supplement, you should consult your JSE broker or professional advisor(s).**

The directors of Cloud Atlas (RF) (Proprietary) Limited ("**Cloud Atlas**" or "**the Manager**"), whose names are set out on the inside front cover of this Supplement, collectively and individually, accept full responsibility for the accuracy of the information contained in this Supplement and certify that, to the best of their knowledge and belief, no facts have been omitted the omission of which would make any statement herein false or misleading and that they have made all reasonable enquiries to ascertain such facts and that this Supplement (as read together with the Programme Memorandum) contains all information required by law and the JSE Listings Requirements.

**If a prospective investor is in any way unclear as to the correct procedure to be followed or the terms and conditions applicable to subscriptions for the Participatory Units referred to herein, the investor is advised to contact his JSE broker or professional advisor.**

Issued on Monday, 27 August 2018 in respect of the Cloud Atlas Collective Investment Scheme in Securities registered in terms of the Collective Investment Schemes Control Act, No. 45 of 2002

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Relating to an **Initial Offer** to subscribe for Dual listed Participatory Units in the AMI Big50 ex-SA ETF of CA CISIS on the Namibian Stock Exchange in respect of Cash Subscriptions, a price (payable in Rand) per Participatory Unit equivalent to 1/850th of the AMI Big50 ex-SA Index Level at the time of listing and subject to the conditions set out in the Programme Memorandum as read together with the Supplemental issued in respect of the primary listing on the Johannesburg Stock Exchange. Application has been made to and to be granted by the NSX for the listing of the AMI Big50 ex-SA Participatory Units under the abbreviated name "NAMB50" in the "Exchange Traded Funds" sector on the Main Board of the NSX.

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Long name: AMI Big50 ex-SA ETF  
Share code: "NAMB50"  
Short name: "NAMB50"  
ISIN code: ZAE000242582



**Manager and Market Maker**  
Cloud Atlas (RF) Proprietary Limited



**Corporate Sponsor Namibia**  
Namibia Equity Brokers



Investec

**Executing Broker**  
Investec Securities Proprietary Limited

VUNANI

CAPITAL

**Corporate Adviser and Sponsor**  
Vunani Corporate Finance

**Computershare**

**Transfer Secretary and Participating Broker**  
Investec Securities Proprietary Limited



**Building a better  
working world**  
**Auditor**

Ernst Young Incorporated



A division of FirstRand Bank Limited

**Trustee and Custodian**  
RMB Custody and Trustee Services Division

*Copies of the Programme Memorandum and this Supplement in relation to the primary listing of the NAMB50 units are available in English only at the registered office of Cloud Atlas (RF) (Proprietary) Limited.*

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## **SUPPLEMENT IN RESPECT OF THE PROGRAMME MEMORANDUM TO SUBSCRIBE FOR PARTICIPATORY UNITS IN THE AMI BIG50 EX-SA ETF OF THE CLOUD ATLAS COLLECTIVE INVESTMENT SCHEME IN SECURITIES**

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### **1. GENERAL**

- 1.1 The AMI Big50 ex-SA Participatory Units shall only be listed on the Main Board of the NSX in the ETF Sector by way of dual-listing.
- 1.2 If any changes are made to the Programme Memorandum or this Supplement that affect the terms and conditions of the AMI Big50 ex-SA Participatory Units, other than changes which are of a formal, minor or technical nature or are made to correct a manifest error or to comply with mandatory provisions of the law, approval from holders of AMI Big50 ex-SA Participatory Units, holding not less than 66.67% of the value of AMI Big50 ex-SA Participatory Units will be required prior to affecting any such change.

## 2. LITIGATION

There are no legal or arbitration proceedings, including any proceedings that are pending or threatened of which the Manager is aware that may have or will have a material effect on the financial position of the Manager.

## 3. DIRECTORS RESPONSIBILITY

The directors of Cloud Atlas, whose names are set out in the Corporate Information and Advisers section of this Supplement, collectively and individually, accept full responsibility for the accuracy of the information contained in this Supplement and certify that, to the best of their knowledge and belief, no facts have been omitted the omission of which would make any statement in this Supplement false or misleading, that they have made all reasonable enquiries to ascertain such facts and that the Supplement contains all information required by law and the JSE Listings Requirements.

## 4. DOCUMENTS AVAILABLE FOR INSPECTION

Copies of the following documents are available for inspection at the registered office of Cloud Atlas at any time during office hours.

- a signed copy of the Programme Memorandum and this Supplement;
- the memorandum of incorporation of Cloud Atlas;
- the written consents of the experts to act in the capacities stated;
- The agreement relevant to the calculation of the AMI Big50 ex-SA Index; and
- The Trust Deed and relevant supplements thereto establishing the AMI Big50 ex-SA ETF.

## 5. SUMMARY OF OFFERING

1.1 Issuer/ETF:	The AMI Big50 ex-SA ETF, an ETF in the Cloud Atlas Collective Investment Scheme in Securities, registered in terms of the Collective Investment Schemes Control Act, No. 45 of 2002.
1.2 ISIN:	ZAE000242582
1.3 Share code:	NAMB50
1.4 Long name of ETF:	AMI Big50 ex-SA ETF
1.5 Short name of ETF:	NAMB50
1.6 Description of participatory units:	AMI Big50 ex-SA Participatory Units
1.7 Distribution or accounting period:	The AMI Big50 ex-SA ETF will make quarterly Distributions at the end of March, June, September and December.
1.8 Any other special conditions and modifications to the terms and conditions set out in the Cloud Atlas Programme Memorandum:	N/A
1.9 Subscription form:	Refer to Annexure 1
1.10 Investment policy:	Refer to Annexure 2

1.11 Management and other fees:	Refer to Annexure 3
1.12 Preliminary expenses:	Refer to Annexure 4
1.13 Composition of the Index:	Refer to Annexure 5
1.14 Performance of the Index:	Refer to Annexure 6
1.15 Anticipated dual listing date	31 August 2018
1.16 Index:	<p>The AMI Big50 ex-SA Index is a market capitalisation weighted index designed to serve as a benchmark for a broader representation, from a sector and country perspective, of the African equity markets, excluding South Africa. The AMI Big50 ex-SA Index is comprised of 50 stocks, and has an attribution feature which slows the momentum of a typical market capitalisation index.</p> <p>The Index shall be rebalanced and updated quarterly at the end of March, June, September and December.</p>

## 6. TAXATION CONSEQUENCES

It is envisioned that subscribers for AMI Big50 ex-SA Participatory Units will be resident in a number of varying countries, each country having its own tax laws.

Therefore no general tax consequences of investing in AMI Big50 ex-SA Participatory Units can be provided and each holder of AMI Big50 ex-SA Participatory Units should consult their tax advisers for advice on the tax treatment of such an investment.

## 7. DISCLAIMER

Although it is the stated policy of the AMI Big50 ex-SA ETF to track the AMI Big50 ex-SA Index as closely as possible, Investors should be aware that perfect tracking of the Index will not be possible in all circumstances and at all times and accordingly no undertaking, warranty or guarantee is given or is to be implied as to the accuracy with which the Index will be tracked by the AMI Big50 ex-SA ETF from time to time or at any time.



**SIGNED AT JOHANNESBURG BY OR ON BEHALF OF ALL THE DIRECTORS OF CLOUD ATLAS (RF) (PROPRIETARY) LIMITED ON MONDAY, 27 AUGUST 2018.**

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**ANNEXURE 1 – SUBSCRIPTION FORM**

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**CLOUD ATLAS COLLECTIVE INVESTMENT SCHEME IN SECURITIES  
("CA CISIS")**

(NSX code: NAMB50 ISIN: ZAE000242582)  
("The Manager" or "the company")

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**APPLICATION FORM**

Initial Offer to subscribe for Participatory Units in the AMI Big50 ex-SA portfolio of CA  
CISIS dual listed on the Namibian Stock Exchange ("NSX")

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Please refer to the instructions overleaf before completing this application form.

<b>Organisation Name</b>	
<b>Primary email address</b>	
<b>Cell phone number</b>	
<b>Telephone number</b>	
<b>Investment Amount in Rands</b>	
<b>Do you have a preferred stock broker in South Africa or Namibia</b>	
If <b>yes</b> , please provide:	
Name of Broker	
Contact number	

If **no**, please note you will need to make an Electronic Transfer to the bank account details provided.

Market maker account:

Bank: Firststrand Bank Limited  
Branch: RMB Corporate Banking Johannesburg  
Branch code: 255-005  
Account name: Investec Securities - Cloud Atlas AMI Big50 Ex-SA ETF  
Account number: 62033942021  
Reference: 1831171

The Manager accepts no responsibility and will not be liable for the correctness of any allocation of AMI Big50 Participatory Units pursuant to payment being made or alleged to have been made by way of electronic transfer due to proof of such payment not being received or purported proof of such payment being insufficient or defective or The Manager, for any reason, not being able to reconcile a payment or purported payment with a particular application for AMI Big50 Participatory Units..

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**DETAILS FOR DELIVERY OF SUBSCRIPTION FORMS**

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<b>Postal address</b>	Cloud Atlas (RF) Proprietary Limited Ground Floor Cradock Heights, 21 Cradock Avenue Rosebank Johannesburg 2196
<b>Email address</b>	<a href="mailto:trading@cloudatlasinvesting.com">trading@cloudatlasinvesting.com</a> or <a href="mailto:info@cloudatlasinvesting.com">info@cloudatlasinvesting.com</a> Please use <b>Dual listing subscription</b> form in subject line.
<b>Telephone</b>	+2711-268-6288

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**INSTRUCTIONS:**

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1. Submitted application forms will be used to create NAMB50 units.
2. The price per NAMB50 Participatory Unit will be equivalent to R 14.00, the number of units issued to the investor will be equal to **Investment Amount in Rands/R14.00**.
3. Subscription forms should be received on or before **Friday, 03<sup>rd</sup> August 2018**.
4. Investors are advised to contact their brokers ahead of the listing, so that the broker can have the order in the market on the date of listing.
5. Investors are referred to the Supplement to obtain additional information in respect of the AMI Big50 ETF listed on the JSE, as well as the fund factsheet available here: <https://cloudatlasinvesting.com/big-50-ex-sa-etf-factsheet/>.
6. Please note that AMI Big50 Participatory Units will be issued in dematerialised format only.

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**RESERVATION OF RIGHTS**

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The directors of The Manager reserve the right to accept or refuse any application(s), either in whole or in part, or to *pro rata* any or all application(s) (whether or not received timeously) in such manner as they may, in their sole and absolute discretion, determine.

The directors of The Manager reserve the right to accept or reject, either in whole or in part, any application should the terms contained in the Programme Memorandum or Supplement not be properly complied with.

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**TO THE DIRECTORS**

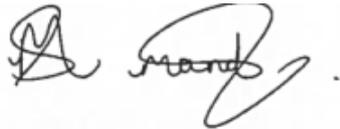
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**Cloud Atlas (RF) (Proprietary) Limited**

7. I/We, the undersigned, confirm that I/we have full legal capacity to contract and, having read the Programme Memorandum and Supplement, hereby irrevocably apply for and request you to accept my/our application for the undermentioned South African Rand amount to be converted into AMI Big50 Participatory Units dual listed as NAMB50.
8. I/We am/are aware that AMI Big50 Participatory Units will be issued in dematerialised form only and will hand this application form to our appointed CSDP or broker. I/We accept that payment in respect of these applications will be, in terms of the custody agreement entered into between me/us and our CSDP or broker, on a delivery versus payment basis.
9. I/We understand that the subscription for AMI Big50 Participatory Units in terms of the Programme and Supplement is conditional on the granting of a listing of the AMI Big50 Participatory Units, by Friday, 03 August 2018 or such earlier/later date as the directors may determine, on the Main Board of the NSX.

**Dated 26 June 2018**

**Place: Rosebank**

A handwritten signature in black ink, appearing to be 'A. Mandy', followed by a period.

**Signature**

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## **ANNEXURE 2 – INVESTMENT POLICY**

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1. The investment policy of the AMI Big50 ex-SA ETF shall be to track the AMI Big50 ex-SA Index as closely as possible, by:
  - 1.1 buying only securities in the same weightings in which they are included in the AMI Big50 ex-SA Index and selling only securities which are removed from the AMI Big50 ex-SA Index from time to time as a result of quarterly Index reviews or corporate actions or which are required to be sold to ensure that the AMI Big50 ex-SA ETF holds securities in the same weighting as they are included in the AMI Big50 ex-SA Index; and
  - 1.2 reinvesting all available income received by the AMI Big50 ex-SA ETF in respect of securities by the purchase of additional securities in the same weightings as they are included in the AMI Big50 ex-SA Index.
2. The AMI Big50 ex-SA ETF shall not buy or sell securities for the purpose of making a profit nor for any purpose other than tracking the AMI Big50 ex-SA Index.
3. It is anticipated that assets in liquid form will not form a substantial part of the AMI Big50 ex-SA ETF's assets. However any liquid assets that the AMI Big50 ex-SA ETF holds may be invested in short-term investments such as banker's acceptances and certificates of deposit.
4. The AMI Big50 ex-SA ETF will acquire and hold a portfolio of securities that substantially represents all of the securities of the AMI Big50 ex-SA Index in substantially the same weighting as in the AMI Big50 ex-SA Index. The Manager will ensure that the AMI Big50 ex-SA ETF is fully covered by the underlying assets that the AMI Big50 ex-SA ETF references at all times.
5. The AMI Big50 ex-SA Index may be adjusted as a result of corporate activities involving Index Constituents. Any adjustments in the AMI Big50 ex-SA Index will be implemented in terms of the relevant Ground Rules and announced on SENS. Any adjustments will be made to ensure that the composition of the AMI Big50 ex-SA ETF is aligned with the AMI Big50 ex-SA Index.
6. The AMI Big50 ex-SA ETF will hold securities purely to replicate the AMI Big50 ex-SA Index, and therefore will not participate in any corporate activities requiring disposal of such securities, if it is not mandatory. In the event the disposal of securities is mandatory, the AMI Big50 ex-SA ETF will participate only up to the extent of the mandatory requirements. If a takeover bid results in an Index Constituent no longer qualifying for inclusion in the AMI Big50 ex-SA Index, any shares of the former Index Constituent held by the AMI Big50 ex-SA ETF after the takeover bid will be disposed of and the proceeds will be applied in effecting the appropriate adjustments to the AMI Big50 ex-SA ETF.
7. The AMI Big50 ex-SA ETF's ability to replicate the performance of the AMI Big50 ex-SA Index will be affected by the costs and expenses incurred by the AMI Big50 ex-SA ETF.
8. The Manager of the AMI Big50 ex-SA ETF shall, if a vote is required by shareholders holding securities in any of the Index Constituents, vote in the best interests of holders of AMI Big50 ex-SA Participatory Units.

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**ANNEXURE 3 – MANAGEMENT AND OTHER FEES**

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The Manager is entitled to a service fee on a quarterly basis calculated as follows:

[(daily market value of the total assets of the AMI Big50 ex-SA ETF, excluding Income Accruals and permissible deductions, if any *multiplied by* the number basis points calculated from table A below) / 365] *accrued on a daily basis for each day* in the relevant quarter,

provided that the Manager at its discretion may waive or reduce any part of the service fee.

The Manager may change any charge for this AMI Big50 ex-SA ETF, introduce additional charges or change the method of calculation of any charge that could result in an increase in charges, provided that:

- not less than 3 months' written notice has been given to every investor;
- the necessary amendments to the relevant Supplemental Deed have been effected in consultation with the Registrar of Collective Investment Schemes; and
- the prior written approval of the JSE has been obtained.

**Table A**

The quantum of the basis points to use for purposes of calculation of the service as per the formula above, shall be calculated from Table A below based on the total assets of the AMI Big50 ex-SA ETF as follows:

Table A

Total assets of AMI Big50 ex-SA ETF	35 basis points
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**ANNEXURE 4 – PRELIMINARY EXPENSES**

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The preliminary expenses in relation to the Initial Offer (inclusive of VAT) are shown below:

<b>Expense</b>	<b>Rand</b>
Annual listing fee (NSX)	NAD 66 700
Index fees (Thomson Reuters)	NAD 250 000
Sponsor fee (NEB)	NAD 50 000

## ANNEXURE 5 – COMPOSITION OF THE INDEX

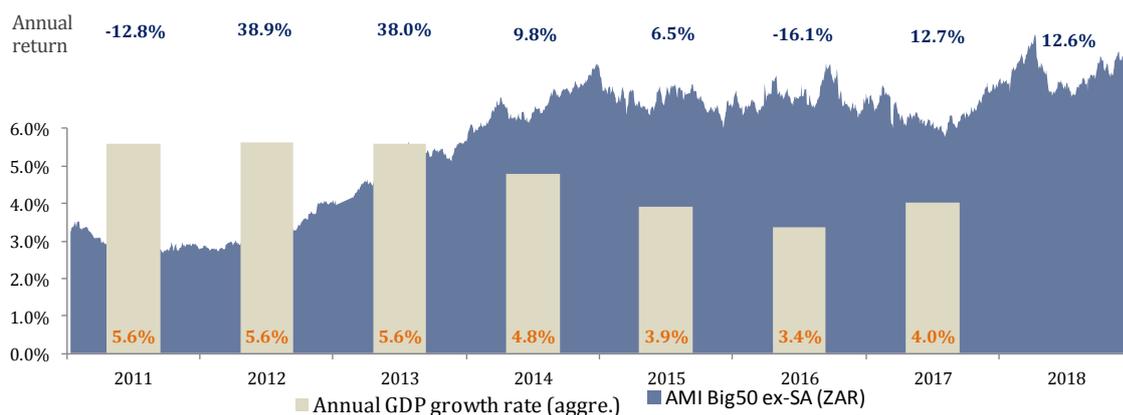
	Constituent	Country	Weighting	Price (ZAR)	1Y Median TP (ZAR)	1Y fwd PE	1Y fwd Divi
1	(Maroc Telecom)	Morocco	12.47%	200.11	204.16	21.276	6.70
2	Coml.Intl.Bank (Egypt)	Egypt	10.00%	65.34	71.82	10.668	1.75
3	Safaricom	Kenya	7.91%	4	3.77	19.293	1.33
4	Guaranty Trust Bank	Nigeria	6.31%	1.54	1.88	6.667	2.91
5	Delta	Zimbabwe	5.42%	24.67	26.66	30.303	0.07
6	Mcb Group Ltd	Mauritius	3.67%	109.22	122.48	8.719	10.35
7	Seed Company Of Zimbabwe	Zimbabwe	3.62%	27.69		27.5	0.05
8	Equity Bank	Kenya	2.80%	6.27	6.80	7.944	2.46
9	Attijariwafa Bank	Morocco	2.42%	679.08	784.20	16.468	13.85
10	Banque De Tunisie	Tunisia	2.33%	44.63	29.41	15.855	0.40
11	Fan Milk	Ghana	2.18%	39.2	54.94	19.301	0.29
12	Nestle Foods Nigeria	Nigeria	2.08%	59.72	47.19	26.362	54.23
13	Econet Wireless	Zimbabwe	2.01%	14.12	16.50	18.158	0.02
14	Egyptian Intl.Pharms.	Egypt	1.95%	103.42	119.90	14.098	7.23
15	Dangote Cement	Nigeria	1.93%	8.68	9.66	13.374	14.05
16	Choppies Enterprises	Botswana	1.86%	3.27	4.53	25	0.04
17	East African Breweries	Kenya	1.73%	29.57	42.79	17.405	8.14
18	Grit Real Estate Income	Mauritius	1.63%	19.6			
19	Elswedey Electric	Egypt	1.56%	152.93	138.00	8.961	11.98
20	Bamburi Cement	Kenya	1.56%	24.28	26.62	13.815	8.30
21	Onatel Bf	BRVM	1.55%	195.05		10.455	
22	Alteo	Mauritius	1.49%	10.13			
23	Lafargeholcim Maroc	Morocco	1.43%	2464.9	2,835.68	19.62	72.59
24	Cosumar	Morocco	1.22%	260.07	293.93	15.432	7.92
25	New African Properties	Botswana	1.22%	4.23			
26	Tanzania Breweries	Tanzania	1.22%	99.41	111.66	14.894	
27	Cal Bank	Ghana	1.07%	3.66	4.64	3.5	0.12
28	Total Maroc	Morocco	1.07%	1589.32	2,826.98	10.471	63.40
29	Talaat Moustafa Group	Egypt	1.06%	8.88	10.87	12.287	0.19
30	Kengen	Kenya	0.97%	0.95	1.58	2.432	1.14
31	Kenolkobil	Kenya	0.97%	2.46	2.68	6.836	1.13
32	Sc.Frigor Brass De Tunis	Tunisia	0.94%	117.41		18.083	0.50
33	Barclays Bk.Of Zimbabwe	Zimbabwe	0.89%	0.89			
34	Zambia Nat.Coml.Bank	Zambia	0.88%	1.3041			
35	Carthage Cement	Tunisia	0.86%	10.66		-10.15	
36	Palmci	BRVM	0.84%	78.07			
37	Umeme	Uganda	0.81%	1.06	2.00	2.531	27.70
38	Douja Prom Addoha	Morocco	0.77%	25.59	63.57	8.075	1.89
39	Label Vie	Morocco	0.72%	3034.17	3,106.99	18.79	42.02
40	Edita Food Industries	Egypt	0.70%	14.17	14.22	27.273	0.27
41	Shell Ci	BRVM	0.66%	26.84			
42	Crdb Bank	Tanzania	0.56%	0.96	1.36	3.718	14.45
43	Telecom Egypt	Egypt	0.55%	10.78	11.05	9.235	0.94
44	Alexandria Mrl.Oils	Egypt	0.48%	8.98	9.36	7.993	0.85
45	Managem	Morocco	0.39%	2275.62	2,495.89	27.839	22.94
46	Seplat Ptl.Dev. (Nsa)	Nigeria	0.36%	24.64	41.15	6.595	0.13
47	Kenya Re-Insurance Corp.	Kenya	0.30%	2.17			
48	Taq Morocco	Morocco	0.27%	1271.46	1,378.48	19.841	41.85
49	Atlanta	Morocco	0.19%	98.97	117.90	21.328	2.43
50	Tanzania Port.Cement	Tanzania	0.12%	9.88	9.88	11.044	133.50

The ETF Constituents set out above are extracted from the latest available information as at end of quarter two 2018. For accurate information on the ETF Constituents consult: [www.cloudatlasinvesting.com](http://www.cloudatlasinvesting.com).

## ANNEXURE 6 – PERFORMANCE OF THE INDEX

The graph set out below illustrates the price performance of the AMI Big50 ex-SA Index for the period from inception to 31 July 2018, on the backdrop of the GDP annual growth rates of the African markets in the index.

Africa GDP Growth rates vs AMI Big50 ex-SA returns



End of month monthly performance								
AMIB50 index (ZAR)	2011	2012	2013	2014	2015	2016	2017	2018
Jan	5.1%	2.6%	0.0%	4.0%	-5.2%	-7.2%	-2.0%	3.1%
Feb	-4.4%	3.5%	0.3%	-5.4%	-1.1%	0.9%	-1.0%	-0.4%
Mar	-6.2%	0.0%	4.4%	-1.4%	6.7%	-3.4%	2.2%	4.4%
Apr	-3.7%	2.6%	-0.9%	5.2%	1.3%	-1.4%	0.9%	6.3%
May	5.9%	9.2%	20.3%	3.4%	-1.7%	11.1%	6.2%	-3.7%
Jun	-4.4%	-4.4%	-11.2%	2.3%	-2.4%	-12.3%	4.8%	5.3%
Jul	-4.8%	4.9%	6.7%	3.1%	-4.8%	-1.5%	1.9%	-2.5%
Aug	-2.8%	9.6%	-0.4%	1.2%	-1.4%	6.3%	3.5%	
Sep	2.2%	3.8%	3.1%	7.4%	8.0%	-4.8%	6.1%	
Oct	5.8%	7.5%	6.8%	-8.5%	-3.9%	3.3%	6.4%	
Nov	-2.2%	-0.6%	3.2%	-3.4%	-1.7%	-7.6%	-7.0%	
Dec	-3.2%	0.0%	5.7%	1.8%	12.6%	0.5%	-9.2%	
<b>Total</b>	<b>-12.8%</b>	<b>38.9%</b>	<b>38.0%</b>	<b>9.8%</b>	<b>6.5%</b>	<b>-16.1%</b>	<b>12.7%</b>	<b>12.6%</b>

The table above sets out the historic monthly values of the AMI Big50 ex-SA.

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## **ANNEXURE 6 – INDEX CALCULATION METHODOLOGY**

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### **1. Introduction**

The text below has been extracted from the Ground Rules.

### **2. Calculation Methodology**

Thomson Reuters will calculate the AMI Big50 ex-SA Index based on the below methodology.

Thomson Reuters will use a divisor driven calculation to calculate the level of the AMI Big50 ex-SA Index.

The Price Return calculation is based on the overall market capitalization of the constituents (price \* No of Shares). In this construction, the sum of the market capitalizations of all the stocks on day t is divided

by the index divisor of day t-1 to arrive to the index level for day t. Please refer formulas below for price return calculation. The Total Return calculation accounts for any gross dividend payment that takes place. When a company issues a dividend, the price of the equity drops in the exact amount of the per share dividend amount. Leaving aside subsequent market movements of the equity price, the impact of a constituent equity dividend upon an index is a drop in the price of the index. Thomson Reuters adjusts to this event by adding back the dividend that was paid, resulting in an index calculation where the numerator includes the sum of dividend amount and the market cap. Please refer formulas below for total return calculation.

- Each index is calculated in ZAR.
- The Pricing used in the index calculations is sourced from the exchanges directly (via IDN) and currency conversions are made using Reuters FX rates as required.
- The intra-day frequency of the calculation is 15s for the Price Return indices and 1m for the Total Return indices. All the indices will have EOD valuation.

### **Price Return**

The market capitalization (cap) weighted index uses the market cap of the constituent (price X No of

Shares) as a weighting factor. Consequently, in this construction, we divide the sum of the market caps of all the stocks in the index at a given time by a quantity which is the sum of the market caps at some initial time divided by an initial index value (e.g., 100). The process must include an initial step to compute an adjustment factor defined as the total market cap at time 0, divided by 100. With respect to the mathematical manipulations (not the quantities), the computation is:

$$\begin{aligned}
 \text{Index Price}_t &= \frac{\sum_{i=1}^n (p_{i,t} \times q_{i,t} \times r_{i,t})}{\sum_{i=1}^n (p_{i,0} \times q_{i,0} \times r_{i,0}) / 100} \\
 &= 100 \times \frac{\sum_{i=1}^n (p_{i,t} \times q_{i,t} \times r_{i,t})}{\sum_{i=1}^n (p_{i,0} \times q_{i,0} \times r_{i,0})}
 \end{aligned}$$

Where:  $p_{i,t}$  = price of equity  $i=1,2,\dots,n$ , at time  $t=0,1,2,\dots,T$  and  $t=0$  means the initial time period,

$n$  = the number of equities in the index,

$q_{i,t}$  = float adjusted shares outstanding for equity  $i$  at time  $t$   
 1, if a country index

$r_{i,t}$  = exchange rate from local currency to USD at time ( $t$ ), if a regional index

100 = the initial value of the index defined as the initial total market cap  $a_0 / f$

The result present in the above equation is generalized in the chain pricing equation:

$$\begin{aligned}
 \text{Index Price}_t &= \frac{\sum_{i=1}^n (p_{i,t} \times q_{i,t} \times r_{i,t})}{\sum_{i=1}^n (p_{i,t-1} \times q_{i,t-1} \times r_{i,t-1}) / (a_{t-1} / f)} \\
 &= \frac{a_{t-1}}{f} \times \frac{\sum_{i=1}^n (p_{i,t} \times q_{i,t} \times r_{i,t})}{\sum_{i=1}^n (p_{i,t-1} \times q_{i,t-1} \times r_{i,t-1})}
 \end{aligned}$$

where:  $t=1,2,\dots,T$ .

The pricing calculations for AMI indices is a bit different from equity indices where only two currencies are involved i.e. local currency and target currency. The difference is due to the multiple currencies involved, as prices are converted to a single currency, ZAR in this case. In such cases, when currency conversions have been applied, the daily index price change will also reflect the daily change(s) in the exchange rates(s). Consequently, index values may change based on the common currency in which they are calculated, i.e., calculating an index value for Hungary in U.S. Dollars will not produce the same value as calculating the same index value in Hungarian Forints, since the index would also reflect the change in HUF->USD exchange rates. To snap the rates, Thomson Reuters stops the official index value at the time of the westerly-most country, yet continues to calculate the index value internally (using an internal symbol) until 22:00 GMT (FX closing time). The next day, instead of using the previous day's official index value published for the calculation, Thomson Reuters uses the internal index value as of 22:00 GMT previous day.

## Total Return

The total return is a quantity which adjusts the price for issuance of dividends<sup>4</sup>. When a company issues a dividend, the price of the equity drops in the exact amount of the per share dividend amount. Leaving aside subsequent market movements of the equity price, the impact of a constituent equity dividend upon an index is a drop in the price of the index. A companion index which is based on the total return adjusts the price-only index for the issuance of dividends by its constituents. The total return index is computed as follows:

$$TRIndexPrice_t = TRIndexPrice_{t-1} \times \frac{\sum_{i=1}^n [(p_{i,t} \times h_{i,t} \times r_{i,t}) + (div_{i,t} \times h_{i,t} \times r_{i,t})]}{\sum_{i=1}^n (p_{i,t-1} \times h_{i,t-1} \times r_{i,t-1})}$$

Where:  $p_{i,t}$  = price of equity  $i=1,2,\dots,n$ , at time  $t=0,1,2,\dots,T$  and  $t=0$  means the initial time period

$n$  = the number of equities in the index

$h_{i,t}$  = the number of shares in equity  $i$  at time  $t$  ==  $q_{i,t}$  or  $s_{i,t}$  depending on whether MC or EQ

weighting is used respectively,

$r_{i,t} = \begin{cases} 1, & \text{if a country index} \\ \text{exchange rate from local currency to USD at time } (t), & \text{if a regional index} \end{cases}$

$div_{i,t}$  = per share dividend on ex-date

All quantities in the equation above are end-of-day quantities. The numerator is computed as per the ex-date for any dividends. The divisor is also adjusted for total return indices on the day following the dividend ex-date. This is done to ensure that the index doesn't fall back down to previous levels (prior to dividend ex-date). This adjustment is done by calculating an adjusted market cap for the total return index immediately after dividend ex-date. The adjusted market cap is the price only market cap as on the dividend ex-date (i.e. excluding index dividend). Once this is divided by the total return index value as on dividend ex-date, we get an adjusted divisor which is used for calculations from the next day onwards. The set-up of the total return index, including initial value, constituents and weights, is identical to the price-only indices.