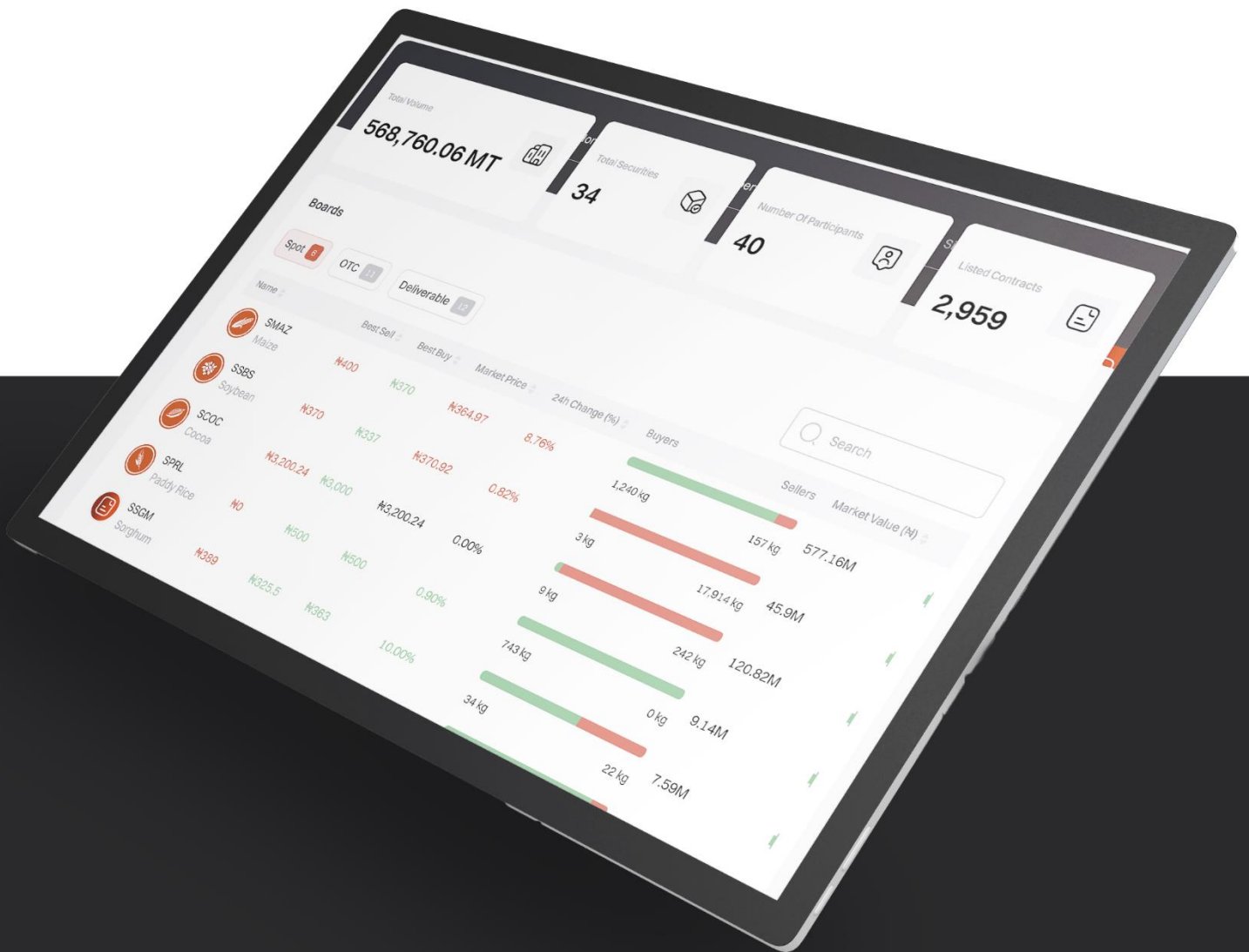# Closing Price
Methodology

VERSION 2

AFEX

CLOSING PRICE (ACP) COMPUTATION

Closing prices of commodities are computed boards i.e., Cash Settled Board, Physical Deliverable Board and Over the Counter Board (OTC). For each of these boards, the closing price is a volume weighted average price of all executed prices for a commodity in any trading day. On the back of this, the AFEX Closing Price (ACP) is calculated as a volume weighted average of closing prices across boards.

The closing price is determined by.

1. Taking the weighted average of all cash settled spot prices.
2. Normalizing the executed price of all trades in the Deliverable and OTC boards to a reference location price per commodity by adding the logistics differential costs (See logistics differential section).
3. Eliminate outliers by
   a. Removing any trades or deliveries with prices outside 15% of the previous closing price
   b. Removing any trades outside of 1 standard dev of all remaining trades to get a 90% confidence interval.
4. Take the weighted average of the new normalized price per board. (Deliverable spot, OTC)
5. Take the weighted average of all three prices to get the closing price of the commodity.
6. Set this commodity price as the opening price for all boards with that commodity.

Mathematically,

$$CP_s = \frac{\Sigma P_i V_i}{\Sigma V_i}$$

$$CP_d = \frac{\Sigma P_x V_i}{\Sigma V_i}$$

$$CP_o = \frac{\Sigma P_x V_i}{\Sigma V_i}$$

Where:
$P_x = Price - Logistics\ differential$
CP_s = Closing Price of cash settled spot
CP_d = Closing Price of deliverable settled spot
CP_o = Closing Price of OTC
V = Volume of each trade in that board
P = Price of each trade in that board

AFEX Closing Price (ACP)

$$ACP = \frac{\Sigma CP_b V_b}{\Sigma V_b}$$

Where:
ACP = AFEX Closing Price
V_b = Total volume of each board
CP_b = Closing Price of each board

The Opening prices of boards at different locations can then be set as

$$Opening\ price = ACP + Logistics\ differentail$$

Note:

1. Daily delivery records are computed for OTC transactions in place of matched contracts.
2. In the circumstances where no trades were executed on the exchange for the day, the published closing price will be the closing price on the prior working day.
3. f no trade is executed on the exchange for five consecutive trading days, the closing price published will be the best-quoted bid in the market.
4. The closing prices are quoted in Naira/contract.

Logistics Differentials

The AFEX Logistics differential leverages actual logistics cost between regions. This is used to estimate the price of a commodity which traded X-location at the reference location of said commodity.

The Logistics Differential of a commodity would be computed as follows.

$$Logistics\ Differential\ = (C_{SR} - C_{SD})$$

Where:

C_{SR} = *Cost of logistics from source region of the commodity to the reference location of same commodity*

C_{SD} = *Cost of logistics from source region of the commodity to the destination of the trade*

These differentials will be added to all executed prices (matched prices) based on trade location to determine the reference price of the trade. The reference prices of trades will then be used to compute the closing price of the commodity.

Source Data

See AfricaExchange.com for current cost of logistics from region to region in Nigeria. This will form the source data used to compute the differentials. These logistics costs are updated as frequently as prices of logistics changes in the open market.

The Table below shows all commodities traded,

- Their source location which is the primary production region in the country
- Their reference location which is the primary consumption region in the country

Both data sets feed into the logistics differential computation.

Commodities	Source Location	Reference Location
Maize	North west	Oyo
Sorgum	North west	Kano
Soybeans	Benue (north east)	Oyo
Ginger	North west	Lagos
Cocoa	south west	Lagos
Wheat	North west	Oyo
Seseme	North west	Kano
Cashew Nut	south west	Lagos
Paddy Rice	North west	Kano

Table 1: source and reference location of commodities