ETF CREATION UNIT CALCULATION METHODOLOGY

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Abstract

Exchange-Traded Funds (ETFs) have gained significant popularity in recent years due to their flexibility, liquidity, and diversification benefits. One of the key mechanisms that enable ETFs to operate efficiently in the secondary market is the creation and redemption process involving creation units.

While the overall concept of Creation Unit is widely explained on the internet, specific calculations for individual components of the Creation Unit for different asset classes - Equity, Debt, Commodity - are not readily available. This white paper aims to provide this clarity.

Key Components of Creation Unit

- Total Basket Value = NAV * Lot units
- Individual Asset Value (e.g., Security, Gold etc.) = Weightage* Total basket amount
- Charges & Taxes -
- 1. For Equity ETF : MF security tax, Stamp duty subscription, stamp duty redemption, NSDL charge.
- 2. Commodity ETF : Stamp duty, CGST, SGST, TDS, TCS
- 3. Debt ETF : Transaction charge
- Cash Component = Total basket value Security basket value

Equity ETF

Sample Creation Unit for Nippon CPSE ETF

Symbol	Quantity	Price	Value
NAV			85.92
BASKET UNITS			100000
TOTAL BASKET VALUE			8592470
CPSE ETF			25-Apr-24
BHARAT ELECTRONICS LIMITED	4834	237.65	1148800
COAL INDIA LIMITED	3078	452.45	1392641.1
COCHIN SHIPYARD LTD.	96	1326.25	127320
NBCC (INDIA) LTD.	923	132.35	122159.05
NHPC LIMITED	4204	91.05	382774.2
NLC INDIA LTD.	431	233.75	100746.25
NTPC LTD	4836	359.2	1737091.2
OIL INDIA LIMITED	483	612.5	295837.5
OIL & NATURAL GAS CORPORATION LTD.	5264	281.95	1484184.8
POWER GRID CORPORATION OF INDIA LIMITED	5695	293.3	1670343.5
SJVN LTD.	955	132.95	126967.25
TOATAL SECURITY BASKET VALUE			8588864.95

CASH COMPONENT(A)	3605.05
TRANSACTION CHARGES(B)	0
MF SECURITIES TRANSACTION TAX(C)	86
NSDL CHARGES(D)	0
UPLOAD CHARGES(E)	0
STAMP DUTY (Subscription) (F)	429.62
STAMP DUTY (Redemption) (G)	1288.32
NOTE : CASH COMP CALCULATION	
CREATION (TO PAY) = A + B + D + E + F	4038.77
REDEMPTION (TO RECEIVE) = A - B - C - D	3523.15
BASKET REDEMPTION (TO RECEIVE) = A - B - C - D - G	2234.82
Note: Stamp duty on redemption will be applicable for basket trade only	

Total Basket Value

= NAV * Lot units = 85.9247 * 100000 = 8592470

Total Basket Value

Let's take example for Bharat Electronics Index weightage = 13.369 % MTM Rate = 237.65 Total basket amount = 8592470

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Stock Amount = Weightage* Total basket amount
= 13.369/100*8592470
= 1148791.758
Quantity = Stock Amount / MTM price = 1148791.758 / 237.65
= 4833.96
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The quantity is adjusted to the nearest whole number, which in this case is rounded to 4834, and then the corresponding amount is revised accordingly.

=4834 * 237.65 = 114880

Security Basket Value

= Sum of amount of all securities =(1148800+1392641.1+127320+122159.05+.....+126967.25) =8588864.95

Charges & Taxes

Charges / Taxes = Rate * Total Basket Value MF security tax = 0.001% * 8592470 = 86Stamp duty subscription =0.01% * 8592470 = 429.6235Stamp duty redemption = 0.0015% * 8592470 = 1288.32

Cash Component

- = Total basket value security basket value
- = 8592470 8588864.95
- = 3605.5

Debt ETF

Sample Creation Unit - Nippon Nifty 8-13 yr G-Sec Long Term Gilt

NAV as on 07 April 2024	25.3913
Creation Unit	250000
Value of creation unit	6347825

Sr. No	SECURITY	QUANTITY	PRICE	VALUE	ACCRUED INTEREST
1	7.26% GOI (MD 06/02/2033)	15700	100.26	1574187	27229.03
2	7.18% GOI (MD 14/08/2033)	42000	99.883	4195102	65338
3	7.1% GOI (MD 08/04/2034)	4700	99.583	468041. 9	2224.66

1	
Value of portfolio deposit	6237331.97
Accrued interest	94791.70
Transaction charges	0
Receivable (Payable) from (to) investor for subscription	15701.32
Payable (Receivable) to (from) investor for Redemption	15701.32
Cash component	15701.32

Value of creation unit

= NAV * Lot units = 25.3913 * 250000 = 6347825

Individual Asset Value

The NSE provides the weightage and price for each bond, and this weightage is calculated at the end of each current month.

Let's take example of 7.26% GOI (MD 06/02/2033) Index weightage = 25.23 MTM Price = 100.266 Total value of creation unit = 6347825 Bond amount = Weightage * value of creation unit = 25.23 * 637825 = 1574187.19 Quantity = Amount / MTM price = 1574187.19/ 100.266 = 15700

Accrued Interest

= NAV * Lot units = 25.3913 * 25 Let's take an example for 7.26% GOI (MD 06/02/2033)

Days = Last IP date (06/02/2024) - Current date (02/05/2024) = 86 Accrued Interest = Coupon rate * Value of security * (Days/360) = 7.26% * 1574187.19 *(62/360) = 27301

Cash component

= value of creation unit - accrued interest - value of portfolio deposit = 15701.32

Receivable (Payable) from (to) investor for subscription

= Cash component + Transaction charge

= 15701

Commodity ETF

Sample Creation Unit - Nippon ETF GOLD BeES

SCRIP	AMOUNT
NAV	26
LOT UNIT	230000
BASKET NAV VALUE	5980000
MUMBAI GOLD PRICE	6237497.72
BASKET VALUE	1
MUMBAI GOLD STAMP DUTY	299
MUMBAI GOLD CGST	93562.46
MUMBAI GOLD SGST	93562.46
MUMBAI GOLD TDS	6237.49
MUMBAI GOLD TCS	6424.62
MUMBAI CASH COMP GOLD SUB	-438385.15
MUMBAI CASH COMP GOLD RED	-451047.27

Basket NAV value

= 26 * 230000 = 5980000

Mumbai gold stamp duty

=0.005% * Basket NAV Value = 299

Mumbai gold CGST

= 1.50% * Mumbai Gold Price = 93562.475

Mumbai gold SGST

= 1.50% * Mumbai Gold Price = 93562.475

Mumbai gold TDS

= 0.1% * Mumbai Gold Price = 6237.49

Mumbai gold TCS

= 0.1% * Mumbai Gold Price = 6237.49

Mumbai cash component gold subscription

Basket nav value = A Mumbai gold price = B Mumbai gold CGST = C Mumbai gold SGST = D Mumbai gold TDS = E = A - B - C - D + E= - 438385

Mumbai cash component gold redemption

= A - B - C - D - E = -451047