

Corporate Bond Valuation Methodology

(Updated up to 24th May 2017)

RBI guidelines for Valuation of Non-SLR Bonds:

A) TRADED BONDS:

As per RBI Master Circular – Prudential Norms for Classification and Operation of Investment Portfolio by Banks dated July 1 2015, “where the debentures/ bonds are quoted and there have been transactions within 15 days prior to the valuation date, the value adopted should not be higher than the rate at which the transaction is recorded on the stock exchange”.

Explanation: The traded price is to be used for valuation of those traded bonds. For this purpose, the volume weighted average price (VWAP) is considered. When a bond is traded on more than one exchange or OTC trades in a bond are reported to more than one exchange the VWAP of all the exchanges is considered. If a bond is traded on more than one day in the last 15 calendar days, the latest VWAP is considered. Bonds traded in the last 15 calendar days (with a minimum of Rs. 5 Cr on any day) only are considered.

FIMMDA’s role for providing traded prices (in compliance of the RBI guideline):

In order to obviate the need to refer to websites of different Exchanges, FIMMDA consolidates and puts up the following traded data on its website on daily basis.

- i) On the working day next to the last trading day Corporate Bond Trades during the last 15 calendar days (Including Failed Trades but excluding Inter Scheme Transfer deals done by MFs)” are given.
- ii) This is a provisional sheet showing the weighted average price and weighted average yield of a bond traded and reported on the Reporting Platforms of NSE (CBRICS), BSE (ICDM) and MCX SX-FIRST.
- iii) If a bond is traded more than one day during the last 15 calendar days, then the data pertaining to the latest trades are only given.
- iv) This sheet consolidates all trades in the individual bonds (whether the settlement is T+0, T+1 or T+2) reported on platforms of all three Exchanges.
- v) On the third working day after the last trading day, when the fate of T+2 trades will also be known, “Corporate Bond Trades during the last 15 calendar days (Excluding failed trades and Inter Scheme Transfer deals done by MFs)” are given.

This is the final sheet showing the weighted average price and weighted average yield of a bond traded, reported and settled. Since failed trades and trades which were not finally settled cannot be considered as “trades” only the second sheet is to be referred to for Valuation purpose.

B) NON- TRADED BONDS- RATED:

As per RBI guidelines, all non-traded debentures/ bonds should be valued on the YTM basis. Such debentures/ bonds may be of different companies having different ratings. These will be valued with appropriate mark-up over the YTM rates for Central Government Securities as put out by PDAI/ FIMMDA periodically. The mark-up will be graded according to the ratings assigned to the debentures/ bonds by the rating agencies subject to the following: -

(a) The rate used for the YTM for rated debentures/ bonds should be at least 50 basis points above the rate applicable to a Government of India loan of equivalent maturity.

a) FIMMDA's Role as Benchmark Administrator:

FIMMDA, as administrator of Corporate Bond valuation matrix, publishes the spread matrix twice a month. CRISIL acts as calculating agent.

Fortnight: Polls are taken on the 15th of a month if it is a trading day. If not, polls are taken on the immediately preceding working day. Matrix is published on the next working day after the polling date.

Month End: Polls are taken on the last working day of the month. Matrix is published on the next working day after vetting by the valuation committee meeting.

b) CORPORATE BOND SPREAD MATRIX METHODOLOGY:

The methodology used for arriving at Corporate Bond Spread Matrix is as under:-

- 1) The bonds are grouped into the following three major industry segments;
 - i) PSU, FIs & Banks
 - ii) NBFCs
 - iii) Corporates
- 2) For each segment spreads for the following ratings are arrived at:
Ratings: AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB and BBB-.
 - Where a security has two or more different ratings from different rating agencies, the lowest of the ratings shall be considered for valuation purposes.
 - A rating is considered as valid only if it is not more than 12 months old as on the date of valuation
- 3) For each segment/rating the spreads for the following maturities are arrived at:
Maturities: 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 15 years.
- 4) **Level 1 Inputs:**
In a waterfall mechanism traded spreads are considered first. For that, volume weighted average yields (VWAY) of bonds issued by certain representative issuers in certain segments/ratings are considered.

Example:

Rating	Segments	Issuers
AAA	PSU/FI/Banks	REC and PFC
AAA	NBFCs	HDFC and LIC Housing Finance
AAA	Corporates	Reliance Industries

The volume weighted average yield (VWAY) levels for the representative issuers, where available are input. In case of multiple trades, on more than one exchange of same issuer, the weighted average yield/price of all the Exchanges is used for the maturity segment.

A band of +/- 0.50 year around the matrix segment is used for considering traded securities. For eg. Trades in securities with residual maturity from 0.50 year to 1.50 year will be considered as 1.00 year segment, 1.51 years to 2.50 years as 2 year segment, etc. We take polls for 1, 3, 5,7,10 and 15 year tenors. While publishing spreads we interpolate for in between tenors like 2, 4,6,8,9 years etc. If there are trades in the bonds issued by the representative issuers, then the traded spreads will replace the interpolated ones. Only traded values of Rs. 5 crore and above are considered.

5) **Level 2 Inputs:** -Procedure for obtaining polls:

a) For the remaining (after level 1 input) segments, ratings and tenors, the polls received from FIMMDA's identified submitters are considered. The submitters are identified by FIMMDA based on their secondary market volume. It is ensured that different segments of the market are given due representation in the polling. At present there are 21 identified submitters consisting of PSU, Private and Foreign banks and Primary Dealers.

b) Every fortnight, two working days before the Polling date, FIMMDA will circulate the traded data of all bonds during the fortnight/month to the identified submitters (Pollers) and ask them to identify a representative issuer in each segment and rating. The traded yields of the bonds issued by the representative issuer/s will be used as Level 1 input while calculating spread matrix.

c) One day prior to polling on each fortnight / month, FIMMDA will circulate the traded data of all bonds of the fortnight/month along with the names of the identified representative issuers which could, subject to the individual submitter's policy, be used as a reference issuer/bond for polling in that segment and rating. If the representative issuer is not identified, then the submitters will continue to poll as per their expert judgment/internal policy.

d) The submitters are required to poll only for the 1 yr., 3 yr., 5 yr. and 10 yr. tenors for NBFC & Corporate segment and 1 yr., 3 yr., 5 yr., 7 yr., 10 yr. and 15 yr. tenors

for PSU/FI/ Banks segments. For intermediate tenors, the yields and spreads are arrived at by linear interpolation. For 0.5 yr. tenor, the yield and spread of 1 yr. tenor are taken. For 15 yr. tenor in NBFC & Corporate segment the spread is arrived at by extrapolation method. For securities where the residual maturity is more than 15 years, the spread of 15 year is taken.

e) Similarly, the submitters are required to poll only for AAA, AA+, AA, and AA- ratings. For ratings below AA- , a different methodology is used as explained elsewhere.

f) Outliers in each segment/rating/tenor are removed using median and two standard deviation method. That is, any poll/s which is/are away from the median value by two standard deviation (2SD) is/are removed as outlier/s. After the removal of the outlier/s, the median is taken as the representative value.

6) Matrix Generation process- Summary

FIMMDA follows the below mentioned steps for construction of fortnightly matrix for corporate bond from the end of month i.e. September-2016.

- a. Two days prior to every polling date, trades of last 15 calendar days are sent to all identified submitters for identifying segment /rating / tenor wise representative issuers.
- b. The name of representative issuers are sent to all identified submitters one day before the polls are given by the submitters.
- c. Based on the above, data polls are given by the submitters. The poll data are collected and sent to the calculating agent, CRISIL.
- d. The traded yields of the bonds issued by the identified issuer/s will be used as Level 1 input by CRISIL while calculating spread matrix.
- e. For the remaining rating/tenor in each segment, CRISIL will use the polled data for constructing the matrix.
- f. CRISIL does identification of outlier polls based on 2 standard deviations.
- g. After exclusion of outlier polls, median of remaining polls is used for construction of matrix.
- h. Final matrix is sent to FIMMDA which after vetting, disseminates to the market.

7) Fixed spreads for bonds rated below AA-:

The spreads for ratings up to AA- are determined by the traded levels / polls. The spreads for ratings below AA- are determined based on the traded levels during the last three months (excluding AT1 bonds), in the Valuation Committee meeting. These spreads are kept fixed for 3 months. FIMMDA will announce the fixed spreads to be applied for the next 3 months or period as may be determined in the Valuation Committee Meeting.

8) FIMMDA spread matrix is to be used for valuation of bonds which have not traded in the market. The spreads must be added to the base yield corresponding to the residual maturity and not the original maturity. The rated bonds are to be valued by adding the credit spreads to the Par/Base Yield Curve. The Par/Base Yield Curve starts from three-month tenor. For valuation of securities with maturities less than three months, the yield for three-month tenor should be considered.

9) The Spread Matrix starts from six-month tenor. For valuation of securities with maturities less than six months the spread for six-month tenor should be considered.

10) For securities where the residual maturity is more than 15 years, the spreads of 15 years should be added to the base yield of applicable maturity.

11) Whenever a Corporate Bond is traded and reported, the 'traded spread' (of the weighted average traded yield) of that bond, over the G. Sec Par/Base Yield curve would be used for valuing all other bonds of similar rating of the particular Corporate in the particular traded tenor. (Thus, if AAA bond of 'PFC' maturing in 2025 was traded at a price of Rs 98.53 with a spread of 68 bps over the G. Sec Par/Base Yield, all AAA rated PFC bonds maturing in 2025 would be valued with a spread of 68 bps over the G. Sec Par/Base Yield, whereas the traded bond would be valued at Rs 98.53).

12) If more than one bond of the particular corporate with the same rating was traded in that tenor, the higher traded spread would be used for valuing all other similar rated bonds of that corporate in that particular tenor. (Thus, if AAA, 8.84 % PGC -2025 was traded with a spread of 57 bps and AAA, 8.40 % PGC - 2025 was traded with a spread of 60 bps all other AAA rated PGC bonds maturing in 2025 would be valued with a spread of 60 bps).

(Rationale: To bring the valuation of corporate bonds closer to market traded yield and prices and move away from polled yields and prices).

13) FIMMDA may from time to time stipulate different spreads for any specific category, if warranted.

C) BONDS NOT RATED BY A RATING AGENCY BUT A CORRESPONDING RATED BOND OF THE ISSUER EXISTS

As per RBI guidelines, the rate used for the YTM for unrated debentures/ bonds should not be less than the rate applicable to rated debentures/ bonds of equivalent maturity. The mark-up for the unrated debentures/ bonds should appropriately reflect the credit risk borne by the bank.

Explanation: Bonds and debentures, which are NOT rated by a rating agency or have become ‘unrated’ during their tenor, but a corresponding rated bond of the issuer exists, then the unrated bonds will be valued by marking up the credit spread by a minimum of 25% over the equivalent rated long term bond of the same issuer.

D) BONDS, DEBENTURES AND PREFERENCE SHARES WHICH ARE NOT RATED BY A RATING AGENCY, AND NO CORRESPONDING RATED BOND OF THE ISSUER EXISTS

The spreads of BBB- for residual tenor marked up by 25 % will be the applicable credit spreads.

E) BONDS AND DEBENTURES WHICH WERE RATED BY A RATING AGENCY, BUT BECAME UNRATED DURING THEIR TENOR AND NO CORRESPONDING RATED BOND OF THE ISSUER EXISTS

The spreads of BBB- for residual tenor marked up by 25 % will be the applicable credit spreads.

F) BONDS / DEBENTURES HAVING SPECIAL FEATURES

1. As per RBI guidelines, the special securities, which are directly issued by Government of India to the beneficiary entities, which do not carry SLR status, may be valued at a spread of 25 basis points above the corresponding yield on Government of India Securities, with effect from the financial year 2008 - 09. At present, such special securities comprise Oil Bonds, Fertilizer Bonds, bonds issued to the State Bank of India (during the recent rights issue), Unit Trust of India, Industrial Finance Corporation of India Ltd., Food Corporation of India, Industrial Investment Bank of India Ltd., the erstwhile Industrial Development Bank of India and the erstwhile Shipping Development Finance Corporation.

2. Floating Rate Bonds (NON SLR):

Floating Rate Bonds are instruments where the coupon rate is variable and is calculated using a certain predetermined methodology. Crucial to the concept of a floating rate bond is the “Benchmark Rate”, which is a market determined interest rate, used for the computation of the coupon rate from time to time. The frequency at which the coupon rate is reset is called the reset frequency, while the frequency at which coupon payment takes place is the coupon payment frequency.

Method of Valuation of Floating Rate Bonds

- 1) Compute the forward benchmark rate for each reset date.

Computation of the forward rate:

$$(1 + R_1)^{T_1} \times (1 + F)^{(T_2 - T_1)} = (1 + R_2)^{T_2}$$

Where,

R_1 = zero rate for time T_1 ,

R_2 = zero rate for time T_2 ,

F = forward rate for period $(T_2 - T_1)$ at time T_1

While the above formula is most accurate, an approximation may be made as follows:

$$F = (R_2 \times T_2 - R_1 \times T_1) / (T_2 - T_1)$$

- 2) Using the same find the coupon (benchmark plus markup, if any) and the cash flows on the interest payment dates.
- 3) Discount these cash flows by any one of the following methods:
 - i. Discount each cash flow using the Zero-Coupon Yields for that cash flow adjusted for the credit spread corresponding to the rating of the bond.
 - ii. Discount each cash flow using the G-Sec YTM for the full residual maturity of the bond adjusted for the credit spread corresponding to the rating of the bond.

The zero-coupon rates may be taken from any recognized source viz. FIMMDA – PDAI, CCIL, etc.

3. MIBOR linked Bonds:

For bonds linked to MIBOR, the Overnight Index Swap (OIS) market quotes will be used to convert MIBOR into fixed rate for the outstanding tenor. The spread over MIBOR (as per the original terms of the issue) will be added to arrive at the notional fixed coupon. Then the bond will be valued similar to a fixed coupon bond and the valuation methodology given above for corporate bonds/debentures should be followed.

4. Bonds with Floor and Cap:

Bonds with a Collar spread of 25 basis points or less will be valued like a fixed coupon bond with the coupon being the average of the cap and floor. (**Rationale:** *If the Collar spread is small the likelihood of the bond hitting the cap or the floor is higher and the bond would behave like a fixed coupon bond.*)

For bonds with higher collar spread, the banks should separately value the collar through any recognized model and account for the changes in the P & L account as per rules.

5. Staggered redemption bonds:

Staggered redemption bonds would be valued as under:

Approach	Discounting rate	Spreads
Treat as a plain-vanilla bond with residual maturity equal to weighted average maturity of principal flows.	As per weighted average maturity	As per weighted average maturity

6. Perpetual Bonds:

For Perpetual Bonds with single/multiple call option, compute the price for all option dates till the longest point on the base yield curve. Use the price which is the lowest for valuing the bond.

- a. The cash flow of the security relating to the longest point on the Government Securities yield curve is to be considered.
- b. If the securities have a Call Option by the issuer and there is a step-up coupon after the call option, the cash flow should be considered with the step-up coupon after considering the regular coupons up to Call Option date.

7. Coupon bearing and non-coupon bearing Deep Discount Bonds:

The coupon bearing Deep Discount Bonds would be valued as:

- i) Zero Coupon Bonds (Without the coupons)
- ii) The individual coupon flows would be valued as Zero Coupon STRIPS.
- iii) The grossed up present values of (i) + (ii) above would be the price of the coupon bearing Deep Discount Bond at which the bond would be marked to market.

The non-coupon bearing Deep Discount Bonds would be valued as per Para 3.7.3 of RBI Master Circular dated July 1, 2015. That is, ZCBs should be shown in the books at carrying cost, i.e., acquisition cost plus discount accrued at the rate prevailing at the time of acquisition, which may be marked to market with reference to the market value. In the absence of market value, the ZCBs may be marked to market with reference to the present value of the ZCB. The present value of the ZCBs may be calculated by discounting the face value using the 'Zero Coupon Yield Curve', with appropriate mark up as per the zero coupon spreads put out by FIMMDA periodically.

8. Commercial Paper / Certificate of Deposits:

Commercial Papers/Certificate of Deposits of tenor less than one year should be valued at carrying cost (Para 3.7.7 of RBI Master Circular).

9. Bonds with Call and Put Options:

- a. Where bonds have simultaneous call, and put options (on the same day) and there are several such calls & put options in the life of the bond, the nearest date should be taken for Price/YTM calculation
- b. Only Callable Bonds: Bonds, which are only callable by the issuer, will be valued at the lowest of the value/s as obtained by valuing the security to final maturity and valuing the security to call option date/s.
- c. Only Puttable Bonds: Bonds puttable by the investor should be valued at the highest of the value/s as obtained by valuing the security to final maturity and valuing the security to put option date/s.

10. Discom Bonds issued under Financial Restructuring Plan (FRP) and UDAY Bonds:

Under the FRP, initially the Discoms will issue their bonds which will be converted into Special Securities of the concerned State Government on or before 5 years. The coupon of the bonds issued by Discoms may undergo change when the State Government takes over the liability and issues its own Special Security. The Discom bonds are valued as per RBI circular No.DBOD.BP.BC.No.105/21.04.132/2012-13 dated 27.06.2013, considering the bond's maturity as stated by Discoms on its face and/or Term Sheet for which the coupon payments are known. As and when the bond is replaced by a special security by the respective State Government, it will be valued based on the relevant YTM rate for Central Government Securities of equivalent residual maturities of the Special Security issued by the State Government. UDAY Bonds issued by various state governments to repay the DISCOM loans will also be valued (in case the Bonds are not classified under HTM) by adding 50 bps to the Base Yield Curve till specific RBI guidelines for valuation of UDAY Bonds are issued.

11. Tax-Free Bonds:

Tax-Free bonds are to be valued at traded price in case a tax free bond was traded in the last 15 days. In case of other Tax Free bonds, the coupon will be grossed up by a factor equal to the income tax rate applicable for the holder. Thereafter, the bond will be valued as any other bond.

The rationale for grossing up coupon is as under:

The price/value of a bond is the present value of future cash flows. The market yield meant for discounting taxable coupon inflows cannot be obviously used for discounting tax free coupon inflows. So, the option is to gross up the coupon using the applicable tax rate to arrive at taxable coupon. So, if a tax-free coupon is 8% and the tax rate is 33%, then the coupon is grossed up to 11.94%. This grossed up coupon is discounted at the market yield and spread applicable to the issuer segment, credit rating and residual tenor. This logic is tenable if the tax-free bonds give really tax free income.

Income tax angle to the treatment of tax-free bonds:

As per Income Tax Act, the holder of a tax-free bond can deduct the interest income of tax free bonds from the profit. However, as per Section 14A of the Act, no deduction shall be allowed in respect of any expenditure incurred by the assessee for earning the tax-free income for the purpose of computing the taxable income. As per the amendment made in 2016, interest expenses pertaining to investment in tax free bonds will no longer be disallowed. Only general expenses at a fixed rate of 1% of the investment in tax free bonds will be disallowed.

Therefore, banks having investments in tax free bonds may gross up the coupon minus general expenses of 1% of investment and value the investment. Depending upon the tax rates applicable to the individual investor, the grossing up of coupon will vary.

Example:

Tax Free Coupon	= 8.00%
Tax rate applicable to the investor/bank	= 33%
Presumptive general expenditure	= 1.00%
Coupon to be grossed up	= 7.00% (8.00-1.00)
Grossed up coupon	= 7/ (1-33%)
	= 10.45%

12. Security Receipts / Pass through Certificates issued by Reconstruction Company / Securitization Company:

Security Receipts will be valued as per Net Asset Value (NAV) given by the issuing Reconstruction Company / Securitization Company.

The valuation of PTC should be done using the spread matrix applicable to NBFC category.

13. Priority Sector PTCs:

Prior to June 2016, PTCs were valued as equivalent to tax-free bonds. As the Finance Bill 2016 changed the tax-treatment of such instruments, the earlier valuation process for PTCs needed a change. Further, PSL-PTCs additionally serve the purpose of being PSL compliant.

As PSL-PTCs are invested by banks to meet their PSL related regulatory requirement, they are generally bought and held to maturity by the banks. This leads to a total lack of secondary market trades thus resulting in lack of market valuation. Further, there is no mechanism to report primary market deals in PSL-PTCs on to a reporting platform. A parallel, however, could be drawn from investments in RIDF scheme (which serve the purpose of meeting PSL targets). These are carried at cost and are classified as other assets. Given that PSL-PTCs are also to be included in the ANBC computation by the banks (like the RIDF) and lack of a market-determined valuation mechanics, the Valuation Committee in its meetings during June-Aug 2016 had concluded that PSL-PTC bonds may be valued at book value and recommended to the Board which accepted the same vide its meeting on 29th August 2016.

RBI recently felt that these instruments still are non-SLR in nature and so, an alternate valuation methodology was suggested and the same is being discussed with them.

14. Basel III Compliant AT1 Perpetual Bonds:

Based on the actual trades in AT1 bonds during a particular month, FIMMDA publishes spreads for AT1 bonds after discussions in the monthly valuation committee meetings. The spreads are published for two ratings viz. AA & Above and AA- & Below and for two tenor's viz. up to 5 years and above 5 years. Valuation of AT 1 perpetual bonds will be done at Yield to first call basis.

Traded bonds spreads (Volume Weighted Average) will be considered for calculation of spreads as above. For all bonds in each rating segment & tenor bracket, volume weighted average will be calculated.

The individual spreads so calculated will be pooled for each rating segment & tenor (up to 5 years / Above 5 years) (AA & above, AA- & below) and their volume weighted average will be arrived. Total of 4 spreads will be published.

In case here are no trades in any tenor, of a rating, then the spreads prevailing in the second tenors will be considered. (eg. Up to AA category, up to 5 years tenor is traded with a spread of 128 but above 5 years is not traded, then 128 will be considered for above 5 years & vice versa.

15. Bonds issued as part of a restructuring of an advance:

Valuation of such instruments is covered under paragraph 18.3 and 19.3 of RBI's Master Circular – “Prudential norms on Income Recognition, Asset Classification and Provisioning pertaining to Advances dated July 01, 2015”.

16. Preference Shares:

Preference shares should be valued as per Para 3.7.4 of the RBI Master Circular (for banks) mentioned above.

However, since dividend on Preference shares is Tax free in the hands of the investor, the valuation treatment indicated in Para 10 above (for Tax free bonds) will be applied with the provision that the Preference share is not valued above its redemption value (Ref Para 3.7.4 (f) of the RBI Master Circular for banks).

17. Priority Sector Bonds:

Priority sector bonds issued by All India Financial Institutions (AIFI) and Public Sector Undertakings should be valued as a corporate ‘AAA’ rated paper.

18. Securitized Paper:

All Securitized papers would be valued on the basis of the Base Yield Curve and the applicable spreads as per the spread matrix relative to the Weighted Average Maturity of the paper.

19. Unrated Government guaranteed Non-SLR bonds:

Those bonds that are issued outside the approved market-borrowing programme may be valued as follows:

- a. Spreads over the sovereign risk free yield curve, at the time of issue, will be applicable.
- b. The spread shall be marked up by 15% if the issue is more than 12 months old.

- c. SGL data, available from January 1, 1996 at RBI website (www.rbi.org.in), should be used for arriving at the credit spreads at the time of issue. In case of debenture/ bond issued prior to January 1, 1996 the bonds will be valued at cost.

20. VALUATION OF SWAPS:

- a. FIMMDA publishes the following benchmarks on a daily basis.
- i. FBIL- OVERNIGHT MIBOR
 - ii. FBIL- TERM MIBOR
 - iii. FIMMDA-Reuters MIFOR
 - iv. FIMMDA-Reuters MITOR
 - v. FIMMDA-Reuters MIOIS
 - vi. FIMMDA-Reuters MIOCS
 - vii. FIMMDA-Reuters Commercial Paper
 - viii. FIMMDA-Reuters Treasury Bill

Where these benchmarks are used for swap transactions, the same will be used for valuing the swap except MIFOR swaps.

Valuation of MIFOR swaps:

MIFOR fixing is published at 16:25 IST during DST (**Daylight Saving Time**) & 17:25 IST on other days. At 12noon the Rolling forwards fixing is published which the underlying for MIFOR is fixing. Due to movement of swap differences during the course of the day, the day end MIFOR value may always undergo a change depending on the time of valuation. Though different banks use MIFOR value taken at different times for valuation of their MIFOR Swaps, there should be consistency in following a particular method as per comprehensive circular issued by RBI in 2007 on derivatives. However, in order to bring in uniformity in month end valuation, the banks should use the FEDAI announced Fx-swap differences for arriving at MIFOR values and that should be used for month end valuation of portfolios.

- b. In respect of the others, the same should be valued at the same benchmarks that were used at the time of entering into the swap transactions

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